Knowledge Sharing in the New Product Development Process:

A case study of Iran Khodro Company

IKCO

A Thesis Presented By:

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Degree of Doctor of Philosophy

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2014

DECLARATION OF AUTHORSHIP

I **Seyed Navid Nasirpourosgoei** hereby declare that this thesis and the work presented in it is entirely my own. Where I have consulted the work of others, this is always clearly stated.

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21/03/2014

ACKNOWLEDGMENTS

In the name of God; Most Gracious & Most Merciful

ABSTRACT

This study aims to investigate issues on knowledge-sharing in the new product development process through a single embedded case study of Iran Khodro Company (IKCO). Although IKCO is a flagship automotive company in Iran, it has struggled to develop new products independently, despite its experience of jointly developing new products with international partners. This raises an important question with regard to knowledge-sharing practice within IKCO, and knowledge-transfer from international partners. Accordingly, this study investigates the way in which Western theory on knowledge-sharing and knowledge-transfer can be applied, refined or developed in the Iranian context. The empirical data are based on 40 in-depth semi-structured qualitative interviews conducted with 25 senior and middle managers from key departments relevant to the new product development process. Secondary data based on published industry reports and unpublished company reports are incorporated to support the analysis of the interview data.

The findings reveal a range of factors that influence four key knowledge-sharing and knowledge transfer processes within the IKCO: (a) knowledge-sharing through a centralised knowledge repository; (b) knowledge-sharing through interaction and socialisation; (c) knowledge-transfer from international partners; and (d) knowledge acquisition, retention and creation within the Research & Development Centre. The findings highlight that, although theory on knowledge-sharing and knowledge-transfer developed in the West are applicable to the Iranian context to some extent, knowledge-sharing and knowledge-transfer processes are considerably influenced by the idiosyncratic organisational context, which in turn is influenced by the wider context, such as the political regime, industry dynamics, technological development and institutional framework.

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CHAPTER ONE: INTRODUCTION TO THE RESEARCH

1.1.   Research Objectives

Formulating and clarifying the research topic is the starting point of a research project (Chauri & Gronhaug, 2002). Saunders *et al.,* (2003, p.25) argued that a research project "may begin with a general focus research question that then generates more detailed research questions or may use general focus research question as a base from which we are going to write a set of research objectives". This study aims to investigate issues on knowledge-sharing in the new product development process in a single embedded case study that of Iran Khodro Company (IKCO). In particular, this study investigates the way in which Western theory on knowledge-sharing and knowledge-transfer can be applied, refined or developed in the Iranian context.

1.2.   The Rational of the Research

The rationale of the research is mainly three-fold in terms of its academic significance, methodological relevance and practical implication.

1.2.1. Academic Significance

In the knowledge management literature, the majority of researchers argue that knowledge management refers to a wide range of practices within an organisation to identify, create, represent, distribute and enable acceptance of insights and experience; such insights and experiences could be embodied in individuals' minds or embedded in organisational processes or practices (Nonaka, 1991). As Barclay & Murray (1997) argue, knowledge management researchers often make a direct connection between an organisation's intellectual assets explicit (codified knowledge) or tacit (personal know-how) and the bottom-line performance of the

business. Prior literature has already investigated the issues and factors affecting the knowledge management processes (specifically knowledge-sharing) within organisations (Walsh and Ungson, 1991; Nonaka and Takeuchi, 1995; Spender, 1996; Kogut and Zander, 1992; Santos *et al.,* 2012). However, our understanding of knowledge management processes and practices outside the developed world is limited. This is especially the case for a large, state-controlled Iranian organisation, such as Iran Khodro Company (IKCO). Within the existing literature, Iranian automotive companies and their knowledge-sharing practices in the new product development process in particular have not been studied systematically. A review of the academic literature showed that there is a gap in this research area in Iranian case study compared with the large number of studies on international automakers (Abdolshah and Abdolshah, 2011). Therefore, the significance of this study is that it will investigate the way in which Western theory on knowledge-sharing and knowledge-transfer can be applied, refined or developed in the Iranian context, and in particular in IKCO.

1.2.2. Methodological Relevance

One of the reasons why there is little prior research on Iranian automotive companies is the difficulty associated with gaining access to these companies. Iranian companies are very cautious about outsiders coming in to investigate their business practices, as is explained in detail in the Methodology section of this thesis. For example, between 2011 and 2012, the Iranian government forbade Iranian students studying abroad from writing any thesis or research about Iran. Mohammad Sossain Majlis-Ara, the director general for student affairs in the Science Ministry announced that, "the new rule applies not just to students on Iranian government scholarships but also to those students paying for their own education abroad" (New York Community Media Alliance, 2011). This is due to a multitude of factors. The political regime of the country tightly controls key state-controlled organisations, such as IKCO. As a result, Iran's political relationships with other countries are

reflected in its organisational policies with regard to engaging with international researchers. Following the political turmoil in Iran in recent years, Iranian companies, such as IKCO, do not allow foreign researchers to collect information from within their organisations (Iran Times, 2011). Iranian students studying abroad also face greater difficulties in gaining access to these organisations and this recent attitude shows that Iran as a society has been much less open to the outside world compared with many emerging market economies and developed economies. Iran's reluctance to engage with the outside world makes it very difficult for researchers to gain access to its organisations. This has been observed in this study, and is explained in further detail in the Methodology section. It is very difficult for researchers to secure research access over a reasonable period of time in order to conduct a large number of in-depth qualitative interviews. This study has had to overcome all of these challenges in order to conduct an embedded case study primarily based on 40 in-depth semi-structured qualitative interviews conducted with 25 senior and middle managers from key departments relevant to the new product development process. Therefore, the empirical work of this study provides unique insights into the largest state-controlled automotive company, IKCO. It is important to mention that based on experience gained during this research, an organisation such as IKCO has a very complex organisational and management structure and the top management team is often associated with the political party in control. This means that a change in the political regime leads to change in the top management, which in turn leads to a change in middle management and usually affects the process of research and access.

1.2.3. Practical Implications

The Iranian automotive industry, as the second main industry after Iran's oil and gas industry, plays a very important role in the country's economy. The industry has more than 50 years of history and employs over half a million people. It has been recognised as one of the biggest automotive industries in the region of the Middle-

East, Central Asia and North Africa. IKCO is Iran's most important automaker, holding over 50% of the local market in terms of unit and value, exporting its products to over 35 different countries all around the world, and employing over 50,000 staff. The company has been an automaker since 1962 and has been involved in many projects, including a number of projects working with international automakers such as Talbot, Mercedes-Benz, Peugeot, Renault and Suzuki, since its establishment. The organisation's production lines cover different types of products, such as commercial cars and passenger cars, which are locally or jointly developed. In addition, IKCO has its own Research and Development Centre. The significance of IKCO in the context of the Iranian economy, its history as the largest Iranian automaker, and its experience of developing new products independently (such as Samand cars) and jointly with international partners (such as SD206 with Peugeot) make IKCO an interesting and relevant case to study knowledge-sharing and knowledge-transfer in the new product development process. The findings of this study provide first-hand insights into how IKCO operates within its organisational and institutional contexts and how its knowledge-sharing and knowledge-transfer processes are comparable with international players.

1.3. The Structure of the Thesis

Following this Introduction, Chapter Two will explain the Research Context, in particular the Iranian automotive industry, in order to provide background information on the case study. Chapter Three will review key academic literature in the area of knowledge management especially knowledge-sharing in the new product development process to provide a foundation for the empirical investigation. Following this, Chapter Four will discuss the key methodological issues, research design and methods employed in this study in an effort to explain how the research was conducted and how the findings were derived. Chapter Five will report the analysis of the data according to the key analytical themes that emerged from the

empirical work. Chapter Six will discuss the key findings in relation to the prior literature and finally, Chapter Seven will summarise the conclusion of the research.

CHAPTER TWO: RESEARCH CONTEXT: THE IRANIAN AUTOMOTIVE INDUSTRY

2.1. Introduction

The aim of this chapter is to clarify that the auto industry is an important trade area in the Iranian economy and has the potential to be a valuable case study for a research project. This research aims to study the performance of Iran Khodro (IKCO) in the NPD processes. To conduct this research successfully, it is important to first understand the industry domestically and internationally. The IKCO is the largest automaker in the Middle East and in Iran, founded with a registered capital of 100 million Rls on 18th of August 1962 by the Khayami family. IKCO's original name was Iran National, but since the 1979 revolution it has been known as Iran Khodro (meaning *car* in Persian). IKCO is a public joint stock company, which aims to produce different types of vehicles and parts, as well as after sales service and exports. Iran Khodro is holding over 50% of the domestic vehicle sales in Iran. This chapter aims to review the automotive industry at the domestic and global levels. Chapter Two will be introduced in three main sections; it will explore the automotive industry and will challenge issues within the Iran Khodro Corporation (IKCO). As a result of data protection policies in the IKCO and in Iran, and owing to access limitations with regard to the data and figures, the company's internal reports and BMI's statistics are two main sources for the company's profile. In addition, national and international news agencies are two other major sources for this chapter. The first part of this chapter will explore the background of the industry (economic, political, geographic and historical development) and the importance of the trade for the country. In the second part, on the one hand focus will be placed on domestic automakers, and they will be compared locally in terms of quantity and quality, and on the other hand the Iranian auto industry will be compared with its international competitors. This comparison study will show the current stand of the Iranian auto Industry. The last part of the section will explore and explain the issues within the

industry and identify the arrangement and planning for the field work. In recent years, Iran has increased the volume of cars produced, rising to the rank of 16th globally in 2007 and becoming the leading supplier of automotives to the Middle-East (Research and Markets, 2008). "By 2008, Iran was producing over a million cars or about 1.43% of global automotive production" (AtiehBahar, 2008, p.1). There are 28 automotive manufacturing units, which are mostly subsidiaries of the 13 main state and privately owned automakers in Iran, actively producing both light and heavy vehicles. These local automakers are engaged in joint ventures with several well-known international automakers such as Peugeot (France), Kia (South Korea), Proton (Malaysia), Chery (China), Mazda (Japan), Nissan (Japan), Mercedes-Benz (Germany) and other established producers of light and heavy vehicles. These automakers produce a wide range of automotives, including motorbikes, passenger cars, vans, mini trucks, medium sized trucks, heavy duty trucks, minibuses, large size buses and other heavy automotives used in commercial and private activities in the country.

Research and Markets (2008) reported that there is a high demand for vehicles in the country, with estimates indicating a requirement of 1.5 million vehicles. This requirement cannot be met due to a lack of capacity in the country's closed car market. Foreign companies which include mostly European and Asian companies are gradually entering the Iranian automotive market for the purpose of assembling improved vehicles in completely knocked down (CKD) kits.

Research and Markets (2008) reported that, despite the high production levels in Iran, it is generally believed by experts that the demand for automotives far outstrips the supply. According to Iranian estimates in 2008, demand stands at a maximum of 1.5 million vehicles, which cannot be reached by the local producers. Such an increase in production is vital for Iran where more than 25% of the cars on Iran's roads are over 20 years old.

2.2. Historical Development of the Iranian Auto Industry

According to a report by Piesing (2007, p.1), in 2007 "Tom Donnelly, the director of the Motor Industry Observatory at the Coventry University Business School, believed that Iran is the major player in the Middle East, and has aims to play with the main automakers of the world motor industry, with a target to raise production to the 1.5– 1.6 million vehicles in the near future". Tom Donnelly argued that if this target is achieved by Iran, it would make Iran's auto production equal size to Britain's auto market. However, the question that arises here is: can the Iranians achieve this target. It is important to remember that Iran believes that the Peugeot 206, 206SD and Samand are its state's automotive industry symbols and can be seen as Iranian auto industry icons in the international auto market (Piesing, 2007).

According to Aftab (2006), 66 million cars were produced worldwide in 2006 and Iranian carmakers reached a record of 1.1 million vehicles produced including different ranges of cars. BMI (2009) statistics show that the number of car 'units' produced has risen every year in Iran since 1997; however, domestic market capacity limitations which may be around 1.5 million unit vehicles a year are forcing domestic carmakers to look for new markets and new customers outside the country's domestic market to ensure that their future business activities are profitable. For instance, Peimani (2003) reported that the Chinese Industry, in a bid to reach its goals of increasing profit and securing its future business activities, has undertaken the step of building relations with companies outside China. In addition, China's Chery Auto Co announced in late February 2003 that it would start making cars in Iran. Apart from friendly ties between the two countries based on their common views on various regional and international issues, the announcement demonstrates that China is taking steps to turn its domestic auto industry into a global player a move in tune with its status as a rising economic power. For example, BMI (2009) confirmed that Chery (Chinese firm) is going to start its operations in Iran.

In addition, the Iranian automakers IKCO and Saipa have already started to take a role in the global auto market. According to Sanat-e Khodro SAPCO (2009, Shahriver, p.15), "the latest statistics on the world's automakers show that Iran has two car manufacturers among the world's top 30 carmakers. Iran Khodro (IKCO) is ranked as 21st and SAIPA as 20th in the world rankings". Table 1 shows the World's top automakers.

Table 1: Worlds auto makers (2007–2008)

No	Company	Unit of car	No	Company	Unit of car
1	TOYOTA (Japan)	9.237.780	16	Avtovaz (Russia)	801.563
2	GM (USA)	8.282.803	17	TaTa (India)	798.265
3	WV (Germany)	6.437.414	18	FAW (China)	637.720
4	Renault & Nissan	5.812.416	19	Fuji (Japan)	616.497
5	Ford (USA)	5.407.000	20	Saipa (Iran)	591.529
6	Hyundai (Korea)	4.172.461	21	IKCO (Iran)	566.200
7	Honda (Japan)	3.912.700	22	Isuzu (Japan)	538.810
8	PSA (France)	3.325.407	23	Chana auto (China)	531.149
9	Suzuki (Japan)	2.623.567	24	DongFeng Auto (China)	489.266
10	Fiat (Italy)	2.524.235	25	Beijing Auto (China)	446.680
11	Daimler (Germany)	2.174.299	26	Chery (China)	350.560
12	Chrysler (USA)	1.893.068	27	SAIC (China)	282.004
13	BMW (Germany)	1.429.918	28	Volvo (Sweden)	248.991
14	Mazda (Japan)	1.349.274	29	Brilliance (China)	241.553
15	Mitsubishi (Japan)	1.209.231	30	Harbin Hafei (China)	226.754

Sanat-e Khodro SAPCO (2009, Shahriver, p.15)

Aftab (2006) reported that Husain Nive, Human Resources Manager of Ford automotive industry believes that, as a result of the rise in the oil price, the country's (Iran) GDP is also going up, resulting in a large number of local people now being able to buy a car in their home country market, which is pushing automakers to keep production levels up for the local market. Moreover, as already mentioned, the low range of car ownership gives other hope to the automakers in Iran.

According to the statistics presented by the Iranian government (Omidvar, 2005; BMI, 2009; OICA, 2006) the number of car units being made is increasing rapidly

between 2005-2009. However, according to the Iranian Ministry of Industry and Mines, the quality of the cars being produced by companies in Iran is very low. For instance, SAIPA's most popular model, Pride, 330,000 units of which have been produced, has a very low quality ranking (–333.1). This (–333.1) point will be explained in the section on the industry's issues in the following pages (Iranian Standard and Quality Inspection, 2012). Another weakness in the car industry in Iran is the limitation for export due to the low quality. During the period 2005–2006, only 15,000 cars were exported to Syria by Iran Khodro and SAIPA, whilst IKCO exported just 3,000 units Samand to Russia. Nevertheless, they are both planning to export over 100,000 vehicles and, as result of these plans, Iran Khodro (IKCO) has opened plants in Senegal, Syria, China, Venezuela, Azerbaijan and Belarus. Moreover, another key plan for the future of Iran Khodro (IKCO) is to export the Peugeot 206SD and Renault Logan L90 worldwide (BMI, 2009).

Furthermore, Azad (2006) reported that Renault's former Chief Executive suggested that Iran could export the L90 if the Renault quality standard could be reached. He also maintained that having IJVs between Iranian domestic carmakers and their International partners could help Iranian companies to enter the International market easily. For example, during 2005–2006, fifty Iranian auto part makers entered the Renault-Nissan network and were able to make trade agreements of up to 640 million dollars. Renault agreed to build the L90 locally in Iran and had manufactured 300,000 units in Iran Khodro and SAIPA by the end of 2010.

2.2.1. International Automakers

The joint ventures with Peugeot Citroen and Renault have provided Iranian automakers with the technology that is vital to achieve their aim. Renault has even prioritised production in Iran over China as it was a late player in China, and with the absence of the Americans due to the sanctions, the Iranian market is uncluttered, as stated by Professor Donnelly. However, how much technology would you transfer to

the Iranians if you were a European producer, knowing their ambition? On the other hand, however, the Peugeot 405 is not exactly considered cutting-edge technology (Piesing, 2007).

Aftab (2006) mentioned that it has been agreed, that in order to increase the quality of products in the automotive industry in Iran, domestic carmakers need to have a strong relationship with International automakers. The former Chief Executive of Iranian Industry development has said that he believes that if the Iranian auto industry wants to be recognised internationally then it needs to have a strategic relationship with international partners. If this is not done, the industry will collapse in this competitive market. Piesing (2007, p.1) reported that Dave Leggett, the editor of the Motor Industry News & Analysis, believes that "the Iranians are with their big ambitions for the new Samand Soren, and that the L90 may be their best bet owing to its price, quality and technology". Dave Leggett in his interview with Piesing (2007), argued that in contrast to the UK, the Iranian government has decided to have a local car manufacturing industry rather than a car manufacturing industry in Iran. Dave Leggett cited in Piesing (2007, p.1), stated that, "the Iranian factories' R&D is remarkable; designing and engineering prototypes despite the sanction". Leggett further stated that, "in actual fact, the sanction encouraged Iranians to be self-sufficient: much like the industry in apartheid-era South Africa and unlike apartheid-era South Africa, there are no shortages of those who will help the Iranians avoid the sanction".

As mentioned previously, the Iranian market is almost unique but it is linked to the political and economic situation within the country. Indge & Godfrey (1998), reported that the number of vehicles in Iran is around 9 million units, with more than 25% of these being more than 20 years old. Combining this information with the estimate that 18 million people in 3.5 million households are in the financial bracket that would allow them to purchase a vehicle, one can see the pent up demand that would exist under more favourable circumstances. If there were only one car for each

of these households, then there is a minimum potential for over 3 million vehicles both as additional to, and replacements for, the existing aged units.

BMI (2009) has argued that assembly operation under licensing agreements will continue to form the backbone of Iran's automotive industry. Iran Khodro (IKCO) has made significant investments to upgrade its facilities, and uses robotics extensively throughout the vehicle-assembly process. BMI (2009) argues that the heavily protected domestic-market will favour Iranian producers and give foreign investors a greater reason to set up joint ventures within the country where there is the largest potential market in the area. BMI (2009) believes that, despite the damaging implications of limited sanctions on investment and technology inflows, a number of factors, most importantly investment by Russia and China and Europe, are likely to alleviate such pressures on Tehran. Iran Khodro is also expanding its manufacturing base outside Iran, concentrating on Samand. In July 2007, the carmaker confirmed its plans to begin the production of the Samand in Senegal. Based in the capital, Dakar, the plant is scheduled to begin production before the end of March 2008. The likelihood of a rise in completely knocked down (CKD) exports to new foreign plants, part-owned by Iranian auto firms, will also help raise auto exports over the forecast period. Despite previously expressing doubts, BMI (2007) now believes that the new plants are set to be completed on or just after their target dates, leading to more substantial increases in exports than were previously forecast.

The history of Iran's auto industry can be divided into three periods: 1969–1978; 1979–1993; and 1994 up to the present time. Iran International Magazine (2003b, p.2) explained that, "the time span in the first category, falling before the 1979 Iranian revolution, is called the period of 'incomplete support' during which the industry depended heavily on oil-related hard currency revenues and its activity was mostly of an assemblage nature".

The time span in the second category partially coincided with the Iraq war (1980–1988). During this period, cars were regarded as luxury items, and did not receive the necessary attention due to the country's preoccupation with war and the shortage of hard currency. As a result the production of cars dropped significantly. When the war ended, there was a brief time span, viewed retrospectively with regret, and referred to as the period of 'lost opportunities' during which a huge sum of money, about $2 billion, was spent on importing 164,000 passenger cars. This $2 billion could have been spent constructively to improve the auto industry and an opportunity was lost.

Nevertheless, in 1993, a new shift began in the Iranian auto industry, which could truthfully be called auto manufacturing activity. Auto manufacturing typically begins with assemblage in most countries; that is, the construction of domestic manufacturing bases for mass production. In between these two phases come parts design, auto design, manufacture of production line machinery etc. The Iranian auto industry developed step by step up until the third stage and due to the strong backwardness that existed at the time, all domestic auto manufacturing units tried to move on a equivalent course, in an attempt to compensate for the backwardness within a reasonable time (Iran International Magazine, 2003b).

The process of industry development began in 1920, when a complete built car (CBU) was imported. This was followed by the assembly of different models of vehicles, CKD (Complete-Knocked-Down), built vehicles and finally a locally built national car named Samand, which was introduced to the market in 2001. Most of Iran's domestic automotive industry dates from 1958 when the government began issuing licences for the assembly of motor vehicles. During the 1960s, the Iranian Jeep Company commissioned the first production line with a total capacity of 3,000 Jeeps a year (Indge & Godfrey, 1998). The first passenger car manufactured in Iran was known as the Paykan. It was produced by Iran Khodro Corporation (IKCO), licensed by the British Talbot Company and offered to the market in 1967 (Iran Yellow Pages, 2008).

Iran Khodro was established in 1962 for the production of Mercedes-Benz buses and mini buses and began production of passenger cars in 1967 when it signed a long-term contract for a local version of the Hillman Hunter (Talbot), which was called the Paykan, meaning (Arrow). Subsequently, over the next 20 years, over a million Paykans were produced, with local substance rising to 67% (Indge & Godfrey, 1998).

In addition, General Motors (GM) and Renault entered the market in the 1970s; GM took over the American Motors plant in 1974 to produce Chevrolets, and later Buicks and Cedillas. Renault took over the Citroen plant and introduced an Iranian version of the Renault 5. In the 1980s, the automotive industry was hit by the withdrawal of many foreign investors around the time of the 1979 revolution; due to the war, this was followed by a sharp decline in the oil price. Not only was there a drop in production to 25% of capacity between 1987 and 1989, but also plans for updating technology had to be abandoned due to the lack of financial resources and diminished foreign investment (Indge & Godfrey, 1998).

BMI (2009) argued that in the early 1990s, the Iranian government launched a crash programme to boost production by making available over $2 billion for imported components and raw materials; finally, the IKCO manufactured the first Iranian national vehicle, the Samand, which was exported to five different countries at the time. Table 2 shows IKCO's exports to those five countries:

Table 2: IKCO's Samand overseas reach

Country	Capacity (CBUs per annum)	Start-up	Total investment (US$ million)
Azerbaijan	6,500 first stage 18,000 second stage	May 2006	10
Belarus	6,000 first stage 60,000 optional second stage	August 2006	25 (40 for optimal second stage)
Venezuela	15,000	November 2006	11
Syria	5,000	2007	60
Senegal	15,000 first phase 45,000 second phase	Na	Na

(BMI, 2009, p.41)

The figure shows an increase within the industry in terms of car quantity. However, in terms of car quality, the figures show that vehicle quality is not very good compared with other international competitors' products and the world standard. Based on the above background, the researcher believes that over the last 50 years, the industry was unable to benefit from its international partners' experiences and its foreign partners could not deliver a tangible benefit to the Iranian local auto industry. Furthermore, the Iranians did not have enough ability to gain more knowledge from their foreign partners. For more than a half a century, local carmakers focused on assembling foreign vehicles rather than aiming at a long-term plan to design a world-class national brand. Peimani (2003, p.2) argued that one of the main reasons for this could be "the 1979 Iranian revolution that suddenly damaged Iranian-American relations and made the American carmakers withdraw from Iran. It also damaged Iran's relations with the most western countries, which lasted to varying extents until the late 1990s".

Peimani (2003) further argued that the political and economic situation has opened up new opportunities for South Korean companies to break through the Iranian market. In the late 1980s, the steady development of Iran–European relations also helped French companies to boost their production into Iran. Japanese companies, such as Mazda and Nissan, also joined the Iranian auto industry. French Peugeot and South Korean companies became the largest car producers and automakers' partners in Iran through joint ventures with certain automakers.

The following interviews highlight some of the historical issues that have arisen within the industry. Ellis (2006, p.2) believes that a "population over 75 million people has much great effect on the country's future. Iran's auto industry has boomed in recent years to become one of the biggest sectors outside of oil/gas, employing over 450,000 people (directly) and accounting for about 4% of GDP. With nearly one million vehicles produced in recent years, as many as in Australia or Thailand, Iran boasts the largest car industry in the Middle East, Central Asia and North Africa".

Ellis (2006, pp.2–3) has interviewed several Iranian auto executives, and has further explored the industry's issues. Iran Khodro, the country's oldest and largest carmaker, is best known for the Paykan, a discontinued knockoff of the Hillman Hunter a 1960s British marquee formerly owned by Chrysler and Peugeot. For example, Mr Mirzaei Iran, Khodro's Deputy President stated, "we can work with European companies, even with Americans. Business is business, and they do not like to lose the benefit of the Iranian market and the region. The past is past and after five or six years, I believe we will be producing Chevrolet". Moreover, "the market is not small here", stated industry analyst Jonathan Poskitt of J.D Power Automotive Forecasting.

There is a huge population of people aged under 40 with money in Iran, and they want the same things as everyone else. However, a number of political issues between Iran and Western countries, particularly the USA, have affected the Iranian auto industry in the last 30 years. Hussein Momeni, SAIPA's Director of Strategic Planning stated that his company negotiated with executives from Chrysler in the 1990s, who said to their would-be partners that US-Iranian relations had thawed sufficiently to warrant exploratory talks. He suggested that Chrysler wanted to introduce a version of the Plymouth Acclaim to Iran, and that the vehicles had even been tested for Iranian conditions. The negotiations proceeded to a semi-advanced stage based on representations by Chrysler that it was able to follow through despite the state of political relations.

Ellis (2006, p.2) also interviewed a former SAIPA executive, who was part of its negotiating team, and who asked not to be identified but backed up this account. He said that, "Chrysler fronted negotiations through its Canadian division and that discreet meetings were held in Istanbul and Dubai, with the two sides agreeing on price and production details. The talks petered out, and after George W. Bush made his Axis of Evil speech, lumping Iran with North Korea and Iraq, chances of rapprochement became as remote as ever. Chrysler has denied that there were any

such talks". Chrysler's spokeswoman stated that neither Chrysler nor any of its subsidiaries had engaged in or authorised anyone else to engage in any meetings or negotiations with any state-owned or other automobile companies in Iran".. The political crash between the US and Iran gave European and Asian automakers an opportunity to enter the Iranian auto industry without a high level of competition with their American automaker competitors. For example, Japan's Mazda has a joint venture with Iran's private Bahman group to make a version of the Mazda and Mercedes-Benz has licensed assembly of two kinds of E-class Mercedes-Benz through IKCO. One of the main European automakers PSA is assembling several types of vehicles in Iran within IKCO and SAIPA, two state-owned car manufacturers. However, it is believed that the lack of competition between international automakers in the Iranian car industry has negatively affected the field. For example, the European and Asian automakers (business partners to the Iranian automakers) are leading the industry; sometimes these international partners ignore contracts and promises already agreed with the Iranian side. The Iranian auto industry is ranked (in 2008-2009) as the 16th largest vehicle manufacturer in the world.

2.3.   The state of the Iranian Auto Industry

Table 3: The world's top 30 automakers

Rank	Country	Production		% of difference
		2007	**2008**	
1	Japan	11,596,327	11,563,629	-0,3
2	China	8,882,456	9,345,101	5,2
3	USA	10,780,729	8,705,239	-19,3
4	Germany	6,213,460	6,040,582	-2,8
5	S. Korea	4,086,308	3,806,682	-6,8
6	Brazil	2,977,150	3,220,475	8,2
7	France	3,015,854	2,568,978	-14,8
8	Spain	2,889,703	2,541,644	-12
9	India	2,253,729	2,314,662	2,7
10	Mexico	2,095,245	2,191,230	4,6
11	Canada	2,578,790	2,077,589	-19,4
12	Russia	1,660,120	1,790,301	7,8
13	England	1,750,253	1,649,515	-5,8
14	Thailand	1,287,346	1,393,742	8,3
15	Turkey	1,099,413	1,147,110	4,3
16	Iran	997,240	1,051,430	5,4
17	Italy	1,284,312	1,023,774	-20,3
18	Poland	792,703	950,908	20
19	Czech Re	937,648	945,822	0,9
20	Belgium	834,403	724,498	-13,2
21	Indonesia	411,638	600,844	46
22	Argentina	544,647	597,086	9,6
23	Slovakia	571,071	575,776	0,8
24	S. Africa	534,490	562,965	5,3
25	Malaysia	441,661	530,810	20,2
26	Ukraine	402,127	423,127	5,1
27	Hungary	292,027	346,055	18,5
28	Australia	334,617	329,556	-1,5
29	Sweden	366,020	309,034	-15,6
30	Romania	241,712	245,308	1,5
31	Others	1,946,218	1,694,903	-------
		73,266,061	70,526,531	-3,7

OICA (2008) cited in Sanat-e Khodro SAPCO (2009 September, p.18)

Iranian carmakers are investing heavily in upgrading models, according to BMI's (2009) latest report. In addition, Iranian automotive production reached 1,108,569 units as of March 20, 2009, including 942,219 passenger cars. BMI's forecast (2009) also shows a total automotive output of 1,130,713 units in Iran for the year ending March 20, 2010, meaning a growth in the number produced compared with the previous year. BMI (2009) expects Iran to become a significant supplier of passenger cars in the region of the Middle-East, the Persian Gulf, North of Africa and Central Asia, particularly to Pakistan, Iraq, Syria, Turkey and Azerbaijan. In addition, BMI (2009) believes that the new mass market models being built in Iran, notably Iran Khodro's 206SD and the Samand models, fit the requirements and price range of less developed emerging markets.

The latest news from Business Monitors Online (2009) showed that IKCO has made an agreement with French automaker Peugeot to produce Peugeot's cars at IKCO's facilities outside Iran. IKCO's Director Javad Najmeddin stated that IKCO will build the Peugeot 206, Peugeot 207 and Peugeot Pars models at its plants in Venezuela, Senegal, Egypt and Syria. In addition, Business Monitors Online (2009) also believes that the Iranian market's strength for all carmakers will depend deeply on exports and producing overseas and as such, they are seeking export opportunities both for CBUs and SKD kits supplied to assembly lines. The story of exporting overseas in the Iranian auto industry began in December 2006, when a number of Iranian and Syrian auto-part manufacturers made preliminary agreements to jointly manufacture automotive parts for the IKCO's Samand assembly line in Syria. Thirty Iranian auto-part firms were involved in the negotiations to set-up joint ventures to supply the Syrian plant. The Samand is initially being assembled from imported CKD parts, but the level of local content is set to increase in the year ahead (2009). The likelihood of a rise in CKD exports to new foreign plants part-owned by Iranian auto firms will also help raise auto exports over the forecast period. Total automotive exports, including parts, are shown in Table 4.

Activities	2007	2008	2009 forecast
Autos exports unit	50,000	45,881	23,692
Autos exports $bn	0.75	0.69	0.36
Autos imports unit	55,965	55,503	50,585
Autos imports $bn	1.12	1.34	1.02
Autos balance of trade $mn	-369	-644	-657

(BMI, 2009, p.20)

Besides the export issue, vehicle ownership is known as another main factor for auto industry growth. The ownership issue will be explored in the next section. The question will be posed here: does the market in Iran have enough demand for auto products?

2.3.1. Vehicle Ownership

The Iranian market offers great potential for vehicle ownership, with little more than 2% of the population owning a car. High import tariff restriction has also made it difficult for foreign firms to sell CBUs in the Iranian market without a local partner. Piesing (2007) stated that the nation has a low car ownership ratio of 1 in 10. In addition, JAMA (2009), cited in Sanat-e Khodro SAPCO (2009 September, p.15), believed that "Iran with a lower range of auto ownership is a good place for international and local automakers to produce and sale cars". Table 5 shows a comparison study of car ownership in 13 different counties.

Table 5 below shows that compared with the top 9 countries, Iran shows great potential for the growth of car ownership, which gives more hope to automakers for their future success.

Table 5: Car ownership

No	Country	Number of people per a vehicle	Number of people per a passenger car	Available cars (Million cars)	
				Total car	Passenger Car
1	USA	1,2	2,2	44	135
2	Italy	1,5	1,7	9,8	35,2
3	Australia	1,5	1,8	3,8	11,1
4	Germany	1,7	1,8	9,7	46,5
5	Canada	1,7	2,6	9,5	12,4
6	France	1,7	2	6,7	30,4
7	Japan	1,7	2,2	5,8	57,5
8	England	1,7	2	5,1	30,9
9	S. Korea	3	4,1	5,8	11,6
10	**Iran**	**7**	**9**	**9**	**7,1**
11	Turkey	8	11,8	9	6,1
12	China	36,6	50	6	26
13	India	66,5	95,7	6,8	11,7

Sanat-e Khodro SAPCO (2009 September, p.15)

2.3.2. Suppliers issues

BMI (2009, p.26) argued that "firms and suppliers across the Iranian manufacturing sector are struggling with rising levels of debt, with many being effectively insolvent and unable to pay their workforce. Despite the government's aim of achieving greater self-sufficiency in automotive parts, the Society of Automotive Spare Parts Manufacturers claimed that by mid-2008, parts producers were owed unpaid debts of around US$1bn by vehicle manufacturers".

BMI (2009) believed that the financial problems of parts manufacturers in Iran have had a major impact on the Iranian automotive industry and its ability to grow and compete in the global market. BMI (2009) argued that suppliers need to develop and improve the parts' quality in order to reduce faults in the finished products. The next section will explore the environmental regulation within the country.

2.3.3. Regulation and Competitive Environment in the Industry

The government has made significant efforts to reduce import tariffs, cutting them to a maximum of 90% on passenger cars and 20% on buses. Nevertheless, tariffs are still high, and foreign investors are still required to seek local partners to start up assembly plants. There is also the problem of the excessive red tape that constrains the private sector, combined with the fact that state-owned firms continue to dominate the auto sector. There is little in the way of competition in the Iranian market and importers are forced to participate in an arcane and lengthy application-procedure to bring CBUs into the country. The government is opposed to allowing any serious foreign challenge to its indigenous auto industry (BMI, 2009).

For example, in April 2003, Ali Mohammad Namazi, a member of the Iranian Parliament's Education and Research Committee, said publicly that if the import of CBUs was to be allowed, "the importers should scrap two dilapidated vehicles for each imported foreign car". In addition, the government's position was confirmed in November 2004, when Minister of Commerce Mohammad Shariatmadari, said that automobile imports by businesses registered in Iran would be permitted with a 130% import tariff rate, reduced to 125% in 2006 and 90% in 2009. At the time, officials in Iran's auto industry warned that this tariff cut would result in a 30% loss in domestic car output with a corresponding loss of 30% of the workforce in the auto sector (BMI, 2009, p.50). However, the Minister commented, "we are confident that the domestic conditions for car imports are ready, we will not allow foreign car imports". The Minister added that more than 15,000 workshops and factories were engaged in car part manufacturing, there were 450,000 people in the industry, and their preservation was the government's duty. Therefore, they would not risk their existence by importing foreign made cars. He also called for technology transfer as a future condition to granting import licences (BMI, 2009, p.50).

Now it is believed that the aim behind this regulation was to give more opportunities to local automakers to produce more cars, as this would guarantee the local automakers' market—even if there were auto imports from outside the country. However, besides this support, Minister of Mines and Metals, Eshagh Jahangiri declared that, "he will encourage and force the Iranian auto industry to increase its quality and decrease its price. He said, he will continue his policies and not permit the excessive import of foreign cars, yet the industry also needs to reach a high quality standard as soon as possible" (Iranian International Magazine, 2003, p.1).

A vital factor behind the development of the Iranian auto industry is the steady increase in the involvement of foreign original equipment manufacturers (OEM). For example, "PSA Peugeot Citroen, Kia Motors, Proton of Malaysia, Nissan Motor and Mazda Motor from Japan, Mercedes-Benz from Germany as well as GAZ from Russia, have entered the Iranian market through local partners. Recently, China's Chery, SangYong Motor from Korea and TaTa Motor from India have announced plans to open assembly lines through JVs in the immediate future" (BMI, 2009, p.51).

BMI (2009) mentioned that, in the current market, for example, the Japanese have focused their market presence on high-end, low-volume vehicles much against local hopes for the build-up of stronger links and this is one of the main reasons why the Japanese are seen as 'ideal partners' for Iranian manufacturers. In the words of Amir Albadvi, an Executive of Iran Khodro, "we want Japanese partners rather than European ones because the demand structure in Iran is more similar to Japan's and we want to learn about productivity and technical skills" (BMI, 2009, p.51).

However, European automakers have not hidden their interest in the Iranian auto market. In addition, PSA (2008) maintains that, with 13 vehicle manufacturers and automakers, over 1,200 parts suppliers and over 15,000 workshops and 450,000–500,000 direct employees, the auto industry is one of Iran's key business sectors. Iran is set to remain the largest car-producing country in the Middle East, according to the

BMI (2009) report. At the same time, Turkey (the world's 15th automaker), earns an advantage from its stronger trading ties with Europe (zone), and presents itself as a cheap manufacturing hub for auto majors. Iran's leading carmaker, Iran Khodro (IKCO), is making strides in the developing world. For instance, "in the year 2006, IKCO opened assembly lines for its Samand in Azerbaijan, Belarus, Venezuela, China, Syria and Senegal with a total maximum capacity of 263,000 units. The assembly line manufacturing Iran Khodro's affordable Samand 'world car' model was launched in Minsk, Belarus, in August 2006, marking the Iranian auto manufacturer's first production line in Europe and the revival of the Belarusian car industry" (BMI, 2009, p.41).

BMI (2007) argued that Iranian carmakers remain dependent on the country's domestic market—a market that is determined by the price of oil; essentially, the motor of the Iranian economy. In contrast, the Turkish and South African car industries are more export-oriented: Turkey is integrating with the EU economy and does not suffer from the domestic and international pressures facing Iran. It is believed that the industry is protected and supported by the government, and it will be difficult for international carmakers to enter the Iranian market and compete with local automakers without having a local partner. The protection plan has the aim of forcing international automakers to transfer their technology to the local industry. This protected environment ensures that there will be neither a high risk nor a high level of competition for the local based industry in the market in the next few years. However, these local automakers are being forced by the government to increase the quality of their products by using their business partners' experience, expertise and technologies. In the following section, 2.3.4, the Iranian auto sector, the Iranian political environment, and the Iranian economic and business environments are briefly analysed (SWOT) to give a clear view of the current situations within the country.

2.3.4. Iran Business Environment PEST Analysis

2.3.4.1. Political factors

BMI (2010, p.7) argued that one strength was that, "since 1979 there has been some decrease in the level of political corruption. Wealth distribution has improved marginally and the political activities strongly supported by the Supreme Leader". However, international and national political conflicts are the main weaknesses in the government's activities that cause the state to plan its business preparations in advance. An opportunity was "the parliament strongly supporting the government's programme in most of the areas; however, a threat was the continuing nuclear tensions increasing the prospect of further US and UN Security Council sanctions and high youth unemployment" (BMI, 2010, p.7). In addition, Market Research (2014, p.1) argued that "improvement in relations with the West bode well for Iran's economy". In conclusion and based on Lakshmanan (2013) argument, recent (2013) international political activities such as nuclear deal between Iran and West will open a new door for the Iranian auto industry to start its collaboration with the World's automakers. BMI (2014, p.8) argued that " Iran and the 5+1 powers clinched a landmark interim deal on the Iran's nuclear programme on November 24 2013, paving the way for partial easing of sanctions. However, BMI cautions that progress towards a more permanent agreement will face substantial difficulties".

2.3.4.2. Economical factors

As its strengths, "Iran has the world's second largest proven oil reserve after Saudi Arabia and the world's second largest proven natural gas reserves after Russia" (BMI, 2014, p.15). In addition, BMI (2014) also argued that besides the oil and gas industry, Iran has a strong agricultural sector. As its weaknesses, local consumption of hydrocarbons is rising rapidly and this, coupled with ageing technology in the oil and gas sector, will have a negative impact on its oil and gas-exporting capacity. International sanctions will keep-out foreign companies to bring much needed

technical knowledge and equipment to maintain industries. As its opportunities, the gas and oil sectors remain underdeveloped and there is considerable room to maximise this source of revenue. In addition, BMI (2014) also argued that a growing population, combined with a shortage of housing, provide opportunities for investment in residential construction. The potential threats are that a further deterioration in Iran's relations with the international community over its nuclear programme could result in the imposition of more extensive economic measures by the UN Security Council or the US (BMI, 2014).

2.3.4.3. Social factors

Iran ended 2012 with a population of 76,424,443 people which represents an increase of 1,000,158 people compared to 2011. Iran is number 17th among the world's countries in terms of country population. Male population is greater than female 50.37% compared to 49.62% women. In addition, Iran shows a moderate population density, with 44 people per square km (CountryEconomy, 2014; World Bank, 2014). In addition, a study by Australian Government, Department of Foreign Affairs and Trade (2014, p.59) has suggested that "Iran's young population will influence the future of the country's business environment. Young population will stimulate demand for foods, housing, education, and information and communication technology and on the other hand, pressure to localise employment will grow as the number of local workforce entrants swells". BMI (2014, p.12) has reported that based on "UN figures, around 45% of population is younger than 25. UNESCO (2010, p.14) argued that these young people create pressures for social system and thus for human opportunities in various sectors. This is reflected in the increased demand for high quality education, high quality health system, work opportunities, life options, and empowerment of both men and women". In conclusion, UNESCO (2010, p.14) believes that Iran has made "significant progress in human development since the 1990's. The country's Human Development Index (HDI) has been rising rapidly, especially due to growth in per capital income and to improved health conditions

contributing to increased life expectancy. Iran remains highly dependent on its one major industry oil-gas which accounts for 10-20% of GDP and 80% of Iran's export income".

2.3.4.4. Technological factors

Since 1979 the US sanctions aimed to weaken the Iran's economic and technologic power. Yet "these sanctions and a very enthusiastic national demand for being independent to the Western or Eastern super power, has led to very remarkable advances in technological fields. Iran has invested considerable resources in hi-tech industries such as aerospace, automotive industry, peaceful nuclear energy and biotechnology. However, the majority of these industries are state-owned and many of them are over staffed and unprofitable and run on low productivities rates, and if they are profitable they enjoy of the extensive subsidies that government pay them" (Rahmati, 2012,p.13).

BMI (2010) believe that, the strengths of the Iranian auto industry are that it is the largest car-producing market in the Middle East and holding over 50% of Iran's auto market. Iranian auto industry also has tie-ups with foreign carmakers and the range of models produced by Iranian auto firms has been expanded and updated. However, the weaknesses of the industry are the heavily protected domestic market and the US trade embargoes, which have cut the country off from investment by US-based manufacturers. Besides this, local parts and components manufacturers face capacity constraints, which will mean greater reliance on foreign imports in car assembly. Finally, IKCO is suffering financial difficulties and is being bailed out by the government. The opportunities are that a limited relaxation on car imports will lead to a rise in inbound shipments and as Iran's car sector grows, it will increasingly rely on outsourcing for parts and components. Finally, the US$1bn scrappage plan for commercial vehicles should boost heavy vehicle sales. BMI (2010, p.6) argued that "the threats are that Iran could be subjected to an international trade embargo over its

nuclear programme, which would affect the importation of parts, the future of joint ventures with foreign firms and Iran's export market in the Middle East. It is worth mentioning that political instability is a key concern for the whole Iranian economy".

The Iranian government has been planning to make the Iranian business and industrial environment including the automotive sector attractive to all investors (domestic and overseas investors). However, most western business and marketing researchers, such as MBI, report that Iran's political risk rating is low, which may affect businesses, for instance. For example, BMI (2009, 2010) mentioned that Iran's political risk rating is at a low rate of 2 out of 10. However, the Iranian government is seeking to provide full protection and guarantees against all possible risks. In addition, Investment Iran (2008) reported that all possible risks are usually insured by the expert credit and investment insurance and in addition, the Iranian government welcomes most possible foreign investments in all areas excluding the military, ammunition and security sections, which are closed to foreign investment. Table 6 shows the number of foreign activities and the total foreign investment in Iran.

Table 6: Foreign investments under FIPPA from 1993–2007 (000$)

Year	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
Projects	2	3	7	13	19	6	18	16	7	27	40	31	59	80	75
Foreign investments (000 US$)	20,320	187,653	122,738	67,004	174,839	5,840	1,049,296	438,669	67,991	612,705	1,357,626	2,702,738	4,275,169	10,277,822	10,782,194

(Investment Iran, 2008, p.1)

The term, 'foreign investor' is defined by the Iranian government as natural persons and legal entities, as well as Iranian nationals and companies, residing either in Iran or abroad. Foreign investors will enjoy the same and equal treatment as accorded to local investors (Investment Iran, 2008). A governmental organisation called FIPPA provides information about investment in all areas of economic activities in Iran

except areas related to arms, ammunition and security, which are closed to foreign investment. In 2007, the government lowered the automotive import tariff levels from 100% to 90% for lightweight vehicles; since then, the number of vehicles being imported into Iran has increased (Research and Markets, 2008).

This interesting domestic policy decided by the Iranian government and parliament of a high tariff level for automotive imports (passenger cars) is encouraging foreign auto industries to set-up their IJVs with the local automakers in Iran, as locally made vehicles are 90% cheaper than imported cars. It is the government's long-term plan to drop the percentage of tariffs for imported passenger vehicles in the next 10 years; however, since 2007, the import tariff for passenger cars has remained at 90%. High tariff levels for passenger vehicles will positively encourage (force) the local automakers to improve the quality of their vehicles, reduce the costs of their products and consider IJVs with foreign partners. It is obvious that, in ten years' time, there will be a highly competitive auto market in Iran, which will create more opportunities for international carmakers to hold a greater share of the auto market in Iran and the local automakers need to reach a better level of auto standard in the next ten years. As threats, the Iran business environment will be affected by the UN, US and EU sanctions, which pose a significant threat to the participation of foreign firms in Iranian business (Iran Daily, 2010; BMI, 2009, 2010; Payvand, 2009).

The importance of the automotive industry in the global economy is widely recognised, and it is also accepted that one of the most important and fastest growing industries in Iran is the automotive industry (Automotive Intelligence News, 2004; BBC News, 2005). The world auto industry is now over 120 years old, and the production of automobiles has reached 58 million units per annum. There are about 100 million people involved in this industry, either directly or indirectly, and the total worldwide sales by the automotive industry has reached $1.3 trillion—$32 billion of which was net profit. This $1.3 trillion constituted 7.3% of the overall gross international productivity or 12% of the developed countries' gross national

productivity. The number of cars running worldwide is almost at 700 million units, raising the auto industry to second place in the industrial manufacturing sector and third place in world economic activities following banking and oil (Iran International Magazine, 2003b). Owing to the importance of the industry, the Iranian government has designated the automobile industry as one of the pillars for its future economic growth and development (Omidvar, 2005). As Table 7 clearly shows, there was growth in passenger vehicle production in the Iranian car market during the period 1997–2009.

Table 7: Passenger vehicles production in Iran

Year of production	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Number of passenger vehicles produced	94,400	133,800	157,000	187,800	249,100	321,400	462,000	660,900	791,900	800,000	941,184	942,219	961,653

(Omidvar, 2005; BMI, 2007, 2009, OICA, 2006)

The importance of the auto industry for Iran is clear. For example, AtiehBahar (2008, p.1) reported that, "Iran's automotive sector is the second most active trade of the country, after its oil /gas industry. Iran has become the largest vehicle producer in the region by producing 46 percent of all cars produced in the region and its neighbouring countries. In addition and during the past decade Iran's automotive industry has had an increasing trend". Moreover, Peimani (2003, p.2) also reported that, "car production in Iran has increased 445 percent between 1997 to 2009 and many new automotive manufacturing companies have been established as well as a relaxation of the Iranian government's protective policies". Being mainly in private hands before 1979, it is now almost run as a state-owned industry. Furthermore, PSA (Peugeot and Citroen) (2008), the world's third-largest automaker, strongly believes that, with 13 main vehicle manufacturers, over 1,200 parts suppliers and 450,000 direct employees, the automotive industry is one of Iran's key business sectors after oil/gas production. Based on the country's automotive stand, Peugeot Citroen entered

the market by assembling vehicles under licence with Iran Khodro (IKCO) and SAIPA, both state-own firms in Iran. The recent data showed Iran as PSA's third main market in the world (Table 8):

Table 8: PSA production line around world

No	Country	Manufactured (units)
1	France	1,348,866
2	Spain	554,632
3	Iran	301,152
4	Brazil	266,110
5	Slovakia	186,142
6	China	171,814
7	Czech Republic	171,814
8	Argentina	132,132
9	Italy	110,551
10	Turkey	65,061

(Sanat-e Khodro SAPCO, 2009 Shahriver, p.14)

PSA (2008) also believes that these results are in line with the Iranian economy's robust growth, which is being led by the automotive industry, amongst others. Strong domestic demand has resulted in a significant increase in imports of intermediate products and capital goods. In addition, an auto industry overview by AtiehBahar (2008) showed that, in 2008, there were 7.17 people per car produced, whilst in 2001 this figure showed 16.8 people per car production in Iran. This increase in car production is mostly attributed to the strong demand in the local market because of population growth, urbanisation, Iran's emerging youth population as well as the increased presence of women in the society (many women drive in Iran). The Iranian manufacturers currently produce six different types of vehicle, including passenger cars, 4WD, buses, minibuses, pickups and trucks. According to the latest statistics provided by the Ministry of Industries and Mines, there are exactly 9,965,734

vehicles in the country. The sector directly employs about 450,000 people and many more in related industries (Ministry of Industry and Mines, 2009). The growth in Iran's car exports reached $1 billion by the end of the Iranian calendar year (March 20). Maps of Iran can be seen on the subsequent pages.

Iran Location

Iran Railway Network

Iran Airports
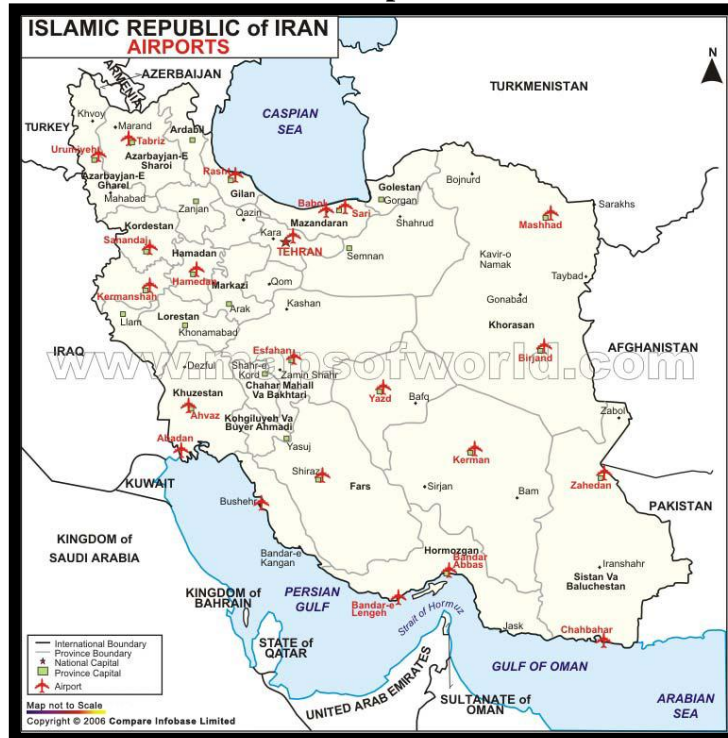
(ISRAJ, 2013)

Iran highways, roads and ports

(ISRAJ, 2013)

Iran is known in many ways as a brilliant place for investment and running business activities. Guide to Invest in Iran (2013, pp.5–7) argued that, "a unique geographical location at the heart of a cross-roads connecting the Middle-East, Asia and Europe, empowered by many inter and trans-regional trade, customs, tax and investment arrangements which are making the Iranian market more attractive for all foreign investors. A market with a population of over 75 million growing steadily as well as quick access to neighbouring markets with approximately 300 million inhabitants are other key reasons for investors to choose Iran as a potential market for their future growth. Furthermore, there is a large pool of trained and efficient manpower at a very competitive cost in a diversified economy with an extensive industrial base and service sector. Moreover, a developing network in the area of telecommunication, roads, railways and airports across the country and the low price of energy (compared to the neighbouring countries) are other important factors for long-term investments. Reserves of natural resources ranging from oil and gas to metallic and non-metallic species reflect the country's accessibility to readily available raw materials. As a final point a four-season climatic endowment is an advantage to agricultural activities throughout the country and throughout all seasons".

2.3.5. Key Players of the Industry

Table 9: Iranian Automakers

No	Automaker	No	Automaker	No	Automaker
1	Iran Khodro (IKCO)	9	Fath Khodro	17	Modiran Pars
2	Saipa Khodro	10	Bam Khodro	18	Rakhsh Khodro
3	Morattab Khodro	11	Aghab Khodro	19	Saipa Diesel
4	Zamyad	12	Karizan Khodro	20	Iran Khodro Diesel
5	Shahab Khodro	13	Marizam Khodro	21	Zarin Khodro
6	Rayan Khodro	14	Hepco	22	Kavir Khodro
7	Bahman Khodro	15	Tractorsazi	23	Oghab Khodro
8	Zagros Khodro	16	Kish Khodro		

(Iran Khodro Internal sources, 2010)

Table 9 categorises 23 Iranian active automakers. IKCO is the largest passenger car producer, which plans to manufacture 1 million passenger cars annually at the end of

its 10-year expansion programme. However, the industry is dominated by two state-owned carmakers: Iran Khodro (IKCO) and SAIPA. Iran's domestic vehicle production comprises 64 models throughout all segments. Eight companies, constituting 95% of the domestic market, are listed on the Tehran Stock Exchange.

The national auto-part manufacturing industry produces some 95% of the components for the Peugeot 405 and Samand models, nearly 70% of the parts for the Peugeot 206 and 100% of the Pride and the phased-out Paykan. However, after-sales service remains poor due to the low quality of locally produced cars. The quality issue within the industry will be explored in the following sections. Table 10 compares IKCO & SAIPA, two main carmakers in Iran.

Table 10: IKCO & SAIPA

	IKCO	**SAIPA**
Founded	1962	1966
Employees	58,000	18,500
Type	State-owned	State-owned
Sales revenue	US$8.0bn (2007)	n/a
Net profit	US$534mn (2007)	n/a
Turnover	n/a	US$4.3bn
Unit cars	566,200 (2008)	591,529 (2008)
Market share	n/a	n/a

(BMI, 2009; Aftab, 2006)

2.3.5.1. SAIPA profile:

BMI (2009) mentioned that SAIPA Khodro is IKCO's most important domestic competitor within Iran. SAIPA was established in 1966 as the French Citroen Production Association and started to manufacture the famous Citroen Dyana in 1968. Later on, in 1977, SAIPA started to produce the Renault 5 followed by the Nissan Junior in1985. In 1993, SAIPA added Renault 21 production to its product basket as a mid-range passenger car, and then SAIPA signed an agreement with Kia Motors to manufacture the Pride in four models. Subsequently, in 1999, SAIPA made

an agreement with PSA Peugeot Citroen to produce the Xantia. The Iranian government is controlling the company via IDRO, an agency of the Ministry of Industry and Mines. For the first time in 1998, Saipa was listed on Tehran Stock Exchange as a first step towards privatisation. It is worth mentioning that exports represent a small part of the company's income. SAIPA exports its products to countries such as Azerbaijan, Iraq, Egypt, Syria and Sudan.

2.3.6. Key Issues in the Industry

Financial factors, the government's new fuel project, quality control, trade sanctions and privatisation have all affected the Iranian auto industry. However, as a result of the research interest, the product quality issue will be explored in this study. BMI (2009, pp.28–29) reported that quality control remains a key issue in the Iranian automotive sector. The Iranian Standards and Quality Control Company (ISQCC) raised a common alarm about the level of faults in Iranian manufactured cars back in December 2005, when it found that models with a high level of locally sourced control had a far higher number of faults than those assembled from imported CKD or semi-Knocked-Down Kits (SKDs).

For example, the Samand had over 300 faults per car on average, whilst the Kia Price and the Peugeot RD had more than 500 faults. Previously, Minister of Mines and Metals, Eshag Jahangiri declared that he would exert his utmost effort to enhance the Iranian auto industry, increase its quality and decrease its price. He said that he would continue his policies and that he would not permit the excessive import of foreign automobiles, which would be a gross disregard of their immense domestic capabilities. This would also jeopardise the future of the auto industry's 450,000 (direct) employees. "With the policies we have implemented, Iran will become the region's pole of auto manufacturing in the near future", he said (Iran International Magazine, 2003, p.2). However, BMI (2009, p.29) reported that the problem of poor quality arose again in September 2007, when the Ministry of Industry and Mines set

up a committee to investigate the problem of highly dangerous fires caused by engines installed in Iranian-manufactured Peugeot models.

BMI (2009) reported that in the first six months of the Iranian calendar in 2008, almost 150 people were killed as a result of their vehicle's engine fire, mostly in the 405 models. The Iranian Parliament's Industrial Commission blamed Peugeot for the exploding vehicles, and demanded compensation from the French company after IKCO claimed that a problem in the fuel systems of the cars was the cause. BMI did not believe the safety problems were the responsibility of Peugeot since the problems were reported in other Iranian-manufactured models, and globally the French firm's safety record is comparable with other international automakers.

BMI (2009), as one of the international market research companies actively monitoring the Iranian auto industry, argued that Iran's automotive quality is becoming a major issue for the industry. In BMI's (2009) report, it highlighted that some of the Iranian automotives/ models had scored very badly on quality, and it found that those models that used locally manufactured parts were of the lowest quality. BMI (2009, p.29) reported that "the poor-quality Pride and the Samand source 80% and 95% of their parts and components from local manufacturers, respectively, whereas the relatively high-quality Peugeot 206 is comprised of just 60% locally manufactured parts. But the problem is not solely related to local parts producers. Quality is also determined by the technologies used in production, adequate training of technicians and the efficiency and performance of company management. Greater attention is being paid to quality control for models marketed abroad, seemingly at the expense of those destined for the domestic market".

2.3.6.1. Quality of new auto products in the Iranian auto industry

There is a high demand for vehicles in Iran. Estimates indicate a requirement for around one million vehicles, which currently cannot be met due to a lack of capacity in the country's closed car market. Around 25% of the vehicle population in Iran is

over 25 years old, and the country's vehicle density is relatively low (Automotive Intelligence, 2004); on the other hand, the Iranian auto industry is facing several key challenges, such as the poor quality of its new products, which is the key interest area of this research. Table 29 shows the quality league table of different auto productions in Iran. The domestic percentages show how much of each vehicle (components) is manufactured in Iran. The table also contains a point column that emphasises car quality as whole, with the Benz E200 being at the top (–47.5) as the best quality car, and the Pajan GLV being at the very bottom of the column as a very poor quality vehicle. These data were obtained from the Ministry of Industry and Mines, Iranian Standard and Quality Inspection, the Department of Vehicle Inspection (Table 11):

Table 11: The Iranian automotive production quality league table (2012)

Quality	Rank	Car's name	Makers' Name Khodro	IJVs	Component domestic make %	Pollution standard	Final product quality	(-) N Point
Very Good Quality	1	Benz E280	Tap	Ger	n/a	EURO II	Very Good	47.5
	2	Benz E200	Tap	Ger	n/a	EURO II	Very Good	50.0
	3	Nisan maxima	Pars	Jap	14,12	EURO II	Very Good	75.0
	4	Grand Nitra	IKCO	Jap	n/a	EURO II	Very Good	78.1
	5	Mazda 3	Bahman	Jap	n/a	EURO II	Very Good	83.4
	6	Megan	Pars	Fra	n/a	EURO II	Very Good	84.1
	7	Citroen Xantia	Saipa	Fre	48,81	EURO II	Very Good	87.0
	8	Peugeot 206 SD	IKCO	Fra	n/a	EURO II	Very Good	89.2
	9	Peugeot 206	IKCO	Fra	75	EURO II	Very Good	89.6
	10	Nissan Roniz	Pars	Jap	16,71	EURO II	Very Good	99.2
	11	Hyundai Onte	Rayn	Kor	n/a	EURO II	Very Good	110.1
	12	Rio	Saipa	Kor	21,83	EURO II	Good	110.4
	13	L90 Saipa	Pars	Fra	n/a	EURO II	Good	124.1
	14	Hyundai Vernay	Rayn	Kor	19,20	EURO II	Good	129.8
	15	L90 IKCO	IKCO	Fra	n/a	EURO II	Good	131.9
	16	Volkswagen Gol	Bam	Ger	14,30	EURO II	Good	134.7
	17	Peugeot Pars	IKCO Kh	Iran	90,46	EURO II	Good	178.1
	18	Peugeot Pars	IKCO	Iran	90,46	EURO II	Good	183.0
	19	Peugeot 405	IKCO Kh	Iran	93,35	EURO II	Good	184.3
	20	Samand	IKCO	Iran	90,73	EURO II	Good	186.3
	21	Peugeot 405	IKCO	Iran	93,35	EURO II	Good	190.2
	22	MVM 110	Modiran	Iran	n/a	EURO II	Good	190.6
	23	Peugeot Roa	IKCO	Iran	n/a	EURO II	Less Acceptable	271.5
	24	Pride Saba	Saipa	Iran	87,73	EURO II	Less Acceptable	276.7
	25	Saipa 132	Saipa	Iran	n/a	EURO II	Less Acceptable	289.1
	26	Pride Pars Khodro	Pars	Iran	87,73	EURO II	Less Acceptable	290.2
	27	Saipa 141	Pars	Iran	87,73	EURO II	Less Acceptable	333.1
Very Low Quality	28	Naron	Bahman	Iran	n/a	EURO II	Unacceptable	
	29	Proton Vyara	Zagros	Iran	35,85	EURO II	Unacceptable	
	30	Pajan GLV	Martab	Iran	n/a	EURO II	Unacceptable	

(Iranian standard & quality inspection Report, 2012, p.1)

Table 12: Explanation of (-) N point: (Negative point)

Year	Period	Quality Very Good	Quality Good	Quality Acceptable	Quality Less acceptable
2007	first 6 months	0 ≤ N ≤160	160<N≤450	450<N≤600	600<N≤800
	2nd 6 months	0≤ N ≤140	140<N≤380	380<N≤550	550<N≤750
2008	first 6 months	0≤ N ≤135	135<N≤320	320<N≤460	460<N≤650
	2nd 6 months	0≤ N ≤130	130<N≤270	270<N≤380	380<N≤580
2009	first 6 months	0≤ N ≤125	125<N≤230	230<N≤300	300<N≤480
	2nd 6 months	0≤ N ≤120	120<N≤200	200<N≤270	270<N≤410

(Iranian standard & quality inspection, 2009)

Table 12 shows the calculation of how the very good, good, acceptable, and less acceptable range of vehicles have been categorised by the Ministry. In order to value such points (-N), the Ministry takes into account three main areas: customer satisfaction, environmental inspection and final part quality inspection. For customer satisfaction, focus is directed towards international and national standards. Environmental inspection is focused on international standards, such as EURO II, EURO III, whilst the final part is centred on quality inspection, which controls the quality of the car as it comes off the production line. This system of ranking gives 0 for the best quality car, which means there is no fault in the current market, and it gives –333.1 or even less for the lowest quality car. This means that the car has earned –333.1 negative points (issues and faults) during the inspection process. Table 13 provides an example of how the calculation (-N point) is carried out for a vehicle.

Table 13: Explanation of the way the N (-) point is calculated:

Car Name	Paint	Production line		Assembly Line						Negative point (-N)
Example Car Name	Body Paint	Impermeability Air & Water	Body test	Unexpected noise	Interior and Exterior	Electronic system	Brake system	Engine system Line shaft system	Snubber Suspension Steering wheel	
QX	5 issues	10 issues	15 issues	10 issues	25 issues	0 issues	0 issues	7 issues	3 issues	-75

(Iranian standard & quality inspection, 2009)

2.3.6.2. Iranian Standard and Quality Inspection (ISQI):

ISQI was founded in 1989 with the aim of establishing and developing a quality management system in the production and service enterprises of Iran and it had the ultimate goal of improving the quality of local industrial products. The company acts as a lever of the Ministry of Industries and Mines, implementing its quality-related policies. The company was established by the Industrial Development and Renovation Organisation of Iran (IDRO) its primary investor and initiator. ISQI's activities started with the inspection of steam boilers; this led on to the inspection of automotive vehicles. In the course of the company's development, by 1996, consultation and quality management were added to the company's activities. Along with a change in strategy and the necessity of using up-to-date technologies, the company has, since 1996, assumed the following specialised missions:

- Active participation in drawing up national standards;
- Offering training programmes on quality systems, organisational excellence models and inspections;
- Offering consultation, contributing to the establishment of quality systems and the design of required up-to-date models;
- Conducting safe technical inspections and engineering tasks in industries at the national level, including: assessment of automotive vehicles.

1- Specific Missions

Promoting the organisation towards excellence up to the level of attaining international credit in the relevant fields to function as a knowledgeable trust with professional ethics whilst protecting stakeholder interests.

1- Designing improvement, consultation and training programs for quality system and business excellence
2- Type approval and production conformance of automotives

3- Monitoring and control of industrial emissions

4- Inspecting imported/exported goods

5- Monitoring automotive after-sales service

6- Dealing with customer complaints.

The company is a certified quality inspection company and ISO 9001-2000 quality management certified for all company departments.

1-1. Vehicle Audit Section

Type approval:

Type approval is an approval granted for vehicles and separate technical units in standard conditions that comply with related standard requirements. The aim of type approval is to ensure that vehicles meet safety, environmental and performance requirements in design and manufacturing. Type approval involves testing, verifying and analysing documentation, and also conducting periodical inspections.

Background of type approval efforts and records:

1. Establishing type approval procedures in collaboration with technical experts
2. Verifying and analysing documentation and test results
3. Checking up product lines
4. Conducting training seminars related to type approval
5. Compiling 55 EEC directives (national standard)
6. Inspection of final product (audit)

Authorised by the Ministry of Industry & Mines, the Vehicle Audit Section at ISQI Co. assumes responsibility for auditing vehicles manufactured all over the country. The types of audit are A, B & C.

Audit A: The A & B audits are approved by the government. Daily sampling and evaluation are applied by the auditors. In this way all cars are delivered without any important defects. Meanwhile the list of known defects is given to the producer for improvement. This control, done by masterly experts, covers about 100,000 cars per year.

Audit B: This checking is carried out in order to establish functional and safety defects during approximately 200 km of running in specific conditions.

Audit C: In this type of audit, the vehicle is driven 20,000 km, and is tested in various environmental and road conditions.

1-2.   Vehicle Pollution Control Department

The department has the mission of technically inspecting locally manufactured vehicles in in respect of exhaust emission levels. To this end, it has compiled emission standards by surveying local and foreign sources. The department fulfils its mission of monitoring and controlling vehicle emissions in three different arenas, namely passenger vehicles, commercial vehicles and motorcycles.

Below is a short list of the department's current activities
1- Categorising and ranking of locally manufactured vehicles on the basis of their technology level and the percentage of localized parts to meet emission standard levels.
2- Conducting technical inspections of technical documents, of all locally manufactured vehicles.
3- Supervision and continuous checking of vehicle production lines to verify compliance with the required technical documents and standards.
4- Vehicle sampling from the production line for emission tests in the TA and COP phases.

5- Technical supervision of emission and fuel consumption tests, according to standards, in various steps of the tests.

6- Analysing and reporting the final state of vehicle emissions and fuel consumption to the authorities concerned.

1-3. Vehicle Parts and Components Inspection Department

The department is engaged in the provision of a technical/engineering service to maintain quality levels by technically inspecting vehicle parts and components.

1- The department provides interested companies, upon request, with parts and components specifications.

2- Specifications of parts and components lacking technical standards are also identified and information about them is provided upon request.

3- Surveying of the assembly line processes and tests, and specifying the other party's control stations, contractual documents, tools, gauges, and control fixtures required by the inspection department.

4- Drawing up technical and quality specifications for parts and components lacking technical specifications and standards.

5- Drawing up procedures and designing control forms along with acceptable quantities and specified tolerances as well as dispatching related reports.

6- Supervising all destructive and non-destructive tests, making all required cheeks, and reporting the results to the client after inspection.

7- Performing a complete audit process, SQFE and product audit, developing SQA.

Major projects implemented for various clients:

1. Inspection of 170 of Iran Khodro's vehicle parts and components
2. Inspection of engines and axles of Pars Khodro's vehicle
3. Inspection of over 150 of SAIPA's vehicles parts and components

4. Inspection of passenger wagon parts and components, drawing up a quality specification record for locally made parts, and performing required destructive and non-destructive tests on the parts.

5. Process auditing based on VDA standard: evaluation and inspection of manufactured axles.

6. Inspection of 15 parts and components of Pride.

1-4. Department of After-sales Service and Customer Feedback Inspection Engineering

The Department of After-sales Service and Customer Feedback Inspection engineering has in its possession a wealth of useful experience gained through inspection operations, ISQI, and is capable of providing the following services:

1. Drawing up practical procedures for the measurement of customer satisfaction in accordance with international standards

2. Measuring customers' satisfaction with the products of the automotive industry (international standard)

3. Conducting customer satisfaction polls and customer satisfaction measurement projects for other public sector production and/or service enterprises

4. Conducting after-sales service inspections of all production and service sectors

5. Drawing up codified programmes with a view to improving the after-sales service performance of authorised repair shops and/or agencies, and providing guidance with respect to quality improvement in compliance with approved Ministry of Industries and Mines directives

6. Investigating accidents and using the expertise of experienced inspectors

7. Conducting technical inspections to pinpoint automobile defects

8. Preparing technical reports concerning vehicle performance

9. Compiling information on procedures and/or instructions with regard to both producer and consumer rights in an attempt to familiarise themselves with relevant policies, rules and regulations.

1.5.   Iranian Centre for Research and Automotive Emission Tests

The centre was established in 2003 with the aim of conducting research and emission tests on both locally manufactured and imported vehicles. The centre is authorised to issue type approval, as well as the conformity of product certificates based on quality standards approved by ISQI. The establishment of the centre which operates under the supervision of ISQI and the Department of the Environment has made it possible to conduct emission tests on both internal combustion and diesel vehicle and motorcycles based on the highest environmental standards. Having a nominal capacity of conducting 1,200 tests per year, the centre started operating on an experimental basis in 2004, dealing with light vehicles. It was officially inaugurated in 2005, assuming the mission of enhancing vehicle quality and reducing vehicle emissions, thus contributing to environmental protection. The centre is now able to deal with both light and heavy vehicles.

It is worth mentioning that all of the top 11 models (Table 11) are produced under IJV projects. Table 14 shows the quality comparison between different products, manufactured from IJV projects and domestic projects within three different major Iranian automakers.

Table 14: Quality comparison between different cars

Auto makers	Product from IJVs project	N (-) point	Product from domestic project	N (-) point	Difference
1) Pars Khodro	Maxima	-75.0	141 model	-333.1	- 258.1
2) Iran Khodro	Suzuki Vitara	-78.1	Roa	-271.5	-193.4
3) Saipa Khodro	Citroen Xantia	-87	131 model	-289.1	- 202.1

(Iranian standard & quality inspection Report, 2012, p.1)

The above table shows that there is a difference in quality of cars produced in IJV projects which are very good quality cars (within Pars Khodro, Maxima –75) compared to the very poor quality cars (within Pars Khodro the 141 model –333.1)

produced from domestic projects in the Iranian auto industry. For example, within the Pars Khodro Co, the Maxima project was managed under Nissan and Pars Khodro as an IJV plan, whilst the model 141 project was controlled by a domestic Iranian management team. Maxima, made through an international joint venture project, is top of the table (the best quality car), whilst the product (model 141) from the Iranian domestic project within Pars Khodro is bottom of the table as the lowest quality car. The above- mentioned evidence shows that a foreign partner's involvement in an IJV project makes a difference to the quality of products (Maxima IJVs project, –75) and (model 141 domestic Project, –33.1) even within the same company. Inside the company, the experience, knowledge and expertise of the foreign partner from the IJV project have had no influence on improving the domestic production project within the same company.

2.4.   The Case Study: Iran Khodro Company (IKCO)

2.4.1. Brief Historical Overview of Development

"Official name of the case study is Iran Khodro Company (IKCO)"(An Introduction to Iran Khodro Group, 2013, p.4).

IKCO's headquarters are located at 14 km on the Jadeh-Makhsus Karaj Road in Tehran. The factory is the main place of its manufacturing activities and spans an area of over 3,375,612 metres square, of which, 1,356,000 metres square has been allocated to built-up sites including enclosures installations and office buildings. The IKCO 'Iran National', prior to the Islamic revolution, was founded in 1962 by two brothers, Ahmad and Mohammad Khayyami, and came into operation on March 19, 1963. IKCO is now Iran's largest industrial corporation and not only the largest automobile producer in Iran, but also in the Middle East, Central Asian and North African regions.

Until 1979, IKCO was assembling the Hillman Hunter in its passenger section. However, in 1979, the production of the British Hillman Hunter stopped in the UK, and Peugeot Citroen - as the main owner of the Hillman Hunter in the UK - started to talk with IKCO to transfer the rights of the company and the production plant from the UK to IKCO, Finally in 1985 the negotiations came to a conclusion and the rights of production and the plant from Linwood in Scotland transferred to IKCO in Iran. IKCO named the Hillman Hunter the Paykan (meaning arrow), and aimed to produce a more advanced version. However, the Islamic revolution changed those plans and Paykan continued to be Iran Khodro's flagship passenger car until the its production finally stopped in March, 2005.

For more than 30 years, IKCO produced the Paykan, a vehicle evolved from the Hillman Hunter. A pick-up version is still in production, and the Samand has taken on the role of the nation's flagship car. In the current situation, IKCO's production lines

have mainly been engaged in the production of the Peugeot 405 in a number of versions: the Peugeot Pars, a new facelift of the 405; the Peugeot 206 in several variants; the Peugeot 207i; and finally the locally developed vehicle, the Samand. The 405 became IKCO's flagship and has already replaced the famous Paykan. According to the latest report by Iranian Standard & Quality Inspection (2012) and BMI (2009), the 405 has almost 95% local parts integration whilst the 206 is still around 70%. IKCO also produces the ROA, a 405 body fitted with the Paykan's engine.

Table 15 gives a summary of the events that have taken place since 1966, and the achievements of the company during these years are categorised, and presented as IKCO's summary of events (2013). It is worth mentioning that, "Iran Khodro Company (Group) is employing around 53,000 people" (Industrial Management Association, 2012, p.5).

2.4.2. Timeline of Key NPD Activities and Knowledge Management Development in IKCO

Table 15 briefly highlights IKCO's production and NPD activities since its establishment in 1962 up until 2012.

Table 15: Events that have taken place from 1966 to 2013 in IKCO

1966	In 1966, Iran Khodro signed a contract with the English company Rootes to make a sedan named 'Paykan'. A year later the car making company 'Iran National' was established with capital of 40 thousand dollars, benefiting from land for a factory, new and old machinery and bank credit to assemble 10 passenger cars and 7 buses and trucks on a daily basis.
1967-78	From 1967 to 1978, the Paykan was assembled in different models: basic, deluxe, sport, station and pick-up; and buses were made as the urban 302, rural and super deluxe. Minibuses and ambulances were also made by the then 'Iran National'. Production increased from the very start and it amounted to 98000 units of Paykan in 1977.

1973	In 1973, localization of car parts and self-sufficiency was set as the main goal and strategy of the company, based on which the companies of Ball bearing, Piston, Tabriz IDEM, Mashad Reza and a casting factory were built.
1974	In 1974, simultaneous with the increasing price of oil and exchange revenues, 'Iran National' chose to assemble Peugeot cars. It was in the same year that the company's shares were introduced to the Tehran Stock Exchange, and 45 percent of the shares were given up to the public.
1977	In late 1977, the company held talks with France's Peugeot to replace the Paykan - which had passed its time - with the Peugeot 305. By the end of the next year, the Islamic revolution of Iran took place and the new government took hold of all industries. According to the Islamic Revolution Council law of Iran Industries Protection and Development ratified in 1980, 'Iran National' due to its nature as an industrial company was sheltered by the National Industries Organization and managed by Ministry of Industries. This was when Iraq started the imposed war against Iran and the trend of foreign exchange and economical setbacks such as the lack of raw material imports, the low quality of products, delayed supply and worn-out machinery in the company extended up to 1982.
1983	1983 can be recalled as a productive year with no specific barriers to the process of production. This came about as the Ministry of Industry was in good shape regarding the acquired strategies and stable foreign exchange condition. Meanwhile, this production growth could be seen in other industries as well.
1983-85	Unlike 1983, 1985 started with a limp in foreign exchange earnings and signs of industrial, economical and production crisis could be seen everywhere, putting the company at risk of shutting down in early 1986.
1988	Two years later, in 1988, the Iran-Iraq war ended. This was when a three-year contract for the production of the Peugeot 405 sedan was inked under the supervision of IDRO (Iran's Industries Development and Renovation Organization) and the Ministry of Industries.

1989	In 1989, simultaneous with Iran's government's emphasis on the production of public vehicles, two major developments took place. First, the Peugeot shop in Iran Khodro was converted in order to produce 6000 sets of buses in two working shifts in a year. Second, in search of a replacement for the Paykan powertrain, as Iran Khodro rolled Paykan off the production line concurrent with Talbot Company being closed, the Peugeot 504 engine was mounted on Paykan, which was then named 'Paykageot' and finally the 'Paykan1800'.
1991	In 1991, Paykan was back on the production line and SAPCO (Supplying Automotive Parts Company of Iran Khodro) was founded.
1994	1994 was the year of big developments as Iran Khodro set down a 7-year programme and the annual production of 300,000 sets. One of the strategic goals, considered in the 7-year programme, was constant quality improvement followed by a ISO 9000 standard project, processed in the company. Different production units in Iran Khodro could meet ISO 9000 requirements by 1998. A Qualitative and quantitative boost in the production of domestic automotive parts was also achieved when SAPCO was established. And finally, the Iran Khodro research and development centre, built with noticeable capital investment can be counted as another development, resulting in the creation of the Samand sedan.
2002	In 2002, Iran Khodro compiled a 10-year programme directed at globalization and for this its strategic goals were quality improvement, and product diversity (especially for the Samand models), a Paykan phase-out, price consistency, competitiveness and inward technology transfer. Cost reduction, a strong presence in domestic market and export development can also be considered as other objectives that were followed seriously. Also in this year, the mass production of the Samand as the national car started.
2003	In 2003, the Pars and Samand models of the year and the Peugeot 206 sedan were put into production.
2004	In 2004, Iran Khodro started to practise use of the SAP software as an enterprise resource planning system in order to improve productivity and planning to acquire a better control over its final operations. It was in this year that the two sedans of the Pars ELX and the Samand Lx were introduced to the market.

2005	The Paykan phase-out in 2005 is regarded as a turning point in the company's history technology-wise, as it was a sign that the company was working towards better customer satisfaction. The Peugeot 206 sedan, the Roa sedan enjoying an optimized OHV engine and the Samand Sarir limo were also marketed this year. In the meantime, Iran Khodro designed its CNG-based engine and targeted global markets.
2006	In 2006, the national engine production line and Samand sedan production lines in Azerbaijan, Belarus and Syria were put into production. Meanwhile, the Tondar 90 sedan (Renault Logan) joined the Iran Khodro cars; thereby the product portfolio was no longer limited to Peugeot cars. The Samand project in Venezuela also commenced this year. Iran Khodro received the EFQM Award in 2007. The production lines in Tabriz, Senegal and Venezuela were inaugurated in the same year and as a new car, the company introduced the Samand Soren to the market.
2008	In 2008, IKCO designed the Runna. This was the same year that the company was elected as the Top Exporter and received the Export National Award and a crystal trophy for Iran's Best Research and development Sector.
2009	The role of IKCO in boosting car production volume in the country was quite tangible in 2009. Focus on global sales led to a 40% growth in IKCO car exports through the IKCO network. Meanwhile, Iran Khodro designed and prototyped a car that enjoyed nanotechnology.
2010	Production of 755,555 cars in 2010 was a new record for IKCO in the region, which counted for almost a 50% share of the market. Moreover, Iran's Industrial Management Organization marked IKCO as the best company under the titles of: o First rank in Sale o First rank in job creation o Second rank in profitability o Best industrial group in Iran's car making companies o Best of all pioneer companies in Iran

2011	A growth in the company's stock value, 40% improvement in IDRO qualitative figures for IKCO, cash flow management, better production chain supply by SAPCO and a two to five percent price reduction in 65 cars concurrent with the first phase of government's rationalization of subsidies plan can be also regarded as other accomplishments in 2010. Reconsidering export strategies based on Iran's Supreme Leader recommendations and exporting 40 thousand cars through the IKCO export network in 2010 with the main emphasis on sending IKCO brand cars to the Islamic countries' markets were put on the agenda. This led to the global sale of 30% of IKCO cars (national car) in 2010. The Dena, as IKCO's latest car enjoys world-class standards regarding technology and design. The process of design and prototyping of this car took less than a year. This sedan was unveiled on April 2011.
2013	The Dena, now called the RUNNA entered IKCO's sales network

IKCO's summary of events (2013, p.1)

The information provided above clearly shows that IKCO has a long-term connection with several international auto makers, such as Peugeot. IKCO is assembling a mixture of different models of Peugeots under licence. Besides passenger cars, IKCO also makes trucks and buses under licence from Mercedes-Benz (see photos and organisation photos at the end of the thesis, referred to as IKCO's productions).

Iran Khodro was assigned a new leader in April, 2010. The Minister replaced Managing Director Manoucher Manteghi, who controlled the automaker for over six years alongside Javad Najmuddin. Based on the above table (Table 33), the life of the Iranian automotive industry can be divided into four main periods.

A): The first period spanned 1969–1979, during which time the government tried to encourage private sectors and industries to import vehicles or assemble vehicles (CKD) within Iran.

B): The second period is the period of survival from 1979 to 1989, when the automotive industry was affected by the 1979 revolution, oil revenues, the shortage of income in the country from the oil export, and finally the Iraqi war against Iran.

C): The third period was 1990–1993, when the import custom (tax) was frozen for three years, and overseas cars were imported to the country. The figure shows that 164,000 vehicles, with a value of US$2 billion, were imported to Iran. This policy affected job opportunities in the automotive industry, and also ensured the future of the spare parts market for foreign carmakers.

D): The fourth period in the automotive industry lifecycle spanned 1994 up until the present. This period can be referred to as the new birth of the industry. During this period, the regulations related to the automotive industry have been developed and a number of major investments have occurred. Parts manufacturing, after-sales networks and IJV projects have all been developed. IKCO, spanning the past five decades, has spent the vast majority of its time both before the revolution and in war-time being involved in the assembly of vehicles. Gradually, from 1990 onwards, IKCO started parts manufacturing, localisation, and from 1995 onwards it became an automotive maker, producing an independent brand (SAMAND), and design and product development. From 2001 to 2006, IKCO planned to take steps towards globalisation and during this period, high-tech lines, high levels of automation, robotic body lines, press, painting design & complementary collection of vehicle production, integration capabilities, and a global network and international marketing capability of the company were created. The production of almost three million vehicles during 2002–2007 is the result of the effort and production of IKCO; more than the total production over the preceding 36 years since its establishment.. In addition, the diversity of vehicles produced was enhanced from 7 to 10 products and from 12 to 50 variants according to customers' needs. As mentioned previously, the actual position of Iranian automotive production in the world rankings is 16th.

Figure 1 shows the general structure of the IKCO Group and the updated list of IKCO's shareholders and their percentage shares is illustrated in Table 16. Finally, Table 17 shows IKCO's investments in the shares of other companies.

Table 16: Composition of IKCO's Shareholders by 19th March 2009-2010

Name of shareholder	Number of shares in 2009	% in 2009	% in 2008
Iran Industrial Development and Renovation Organisation (IDRO)	2,457,000,000	%39	%40
Social Security Investment Company	551,789,778	%8.76	%8.76
Rena Industrial Group Investment	519,613,045	%8.25	%8.50
Civil Retirement Fund	375,486,980	%5.96	%1.70
Civil Retirement Fund Investment	227,676,761	%3.61	%3.61
Samand Investment Company	457,105,156	%7.26	%5.33
Tadbir Investment Company	112,637,018	%1.79	%2.79
Persons and legal entities	1,598,691,262	%25.37	%29.31
Total	**6,300,000,000**	**100**	**100**

(IKCO Internal finance report, 2011)
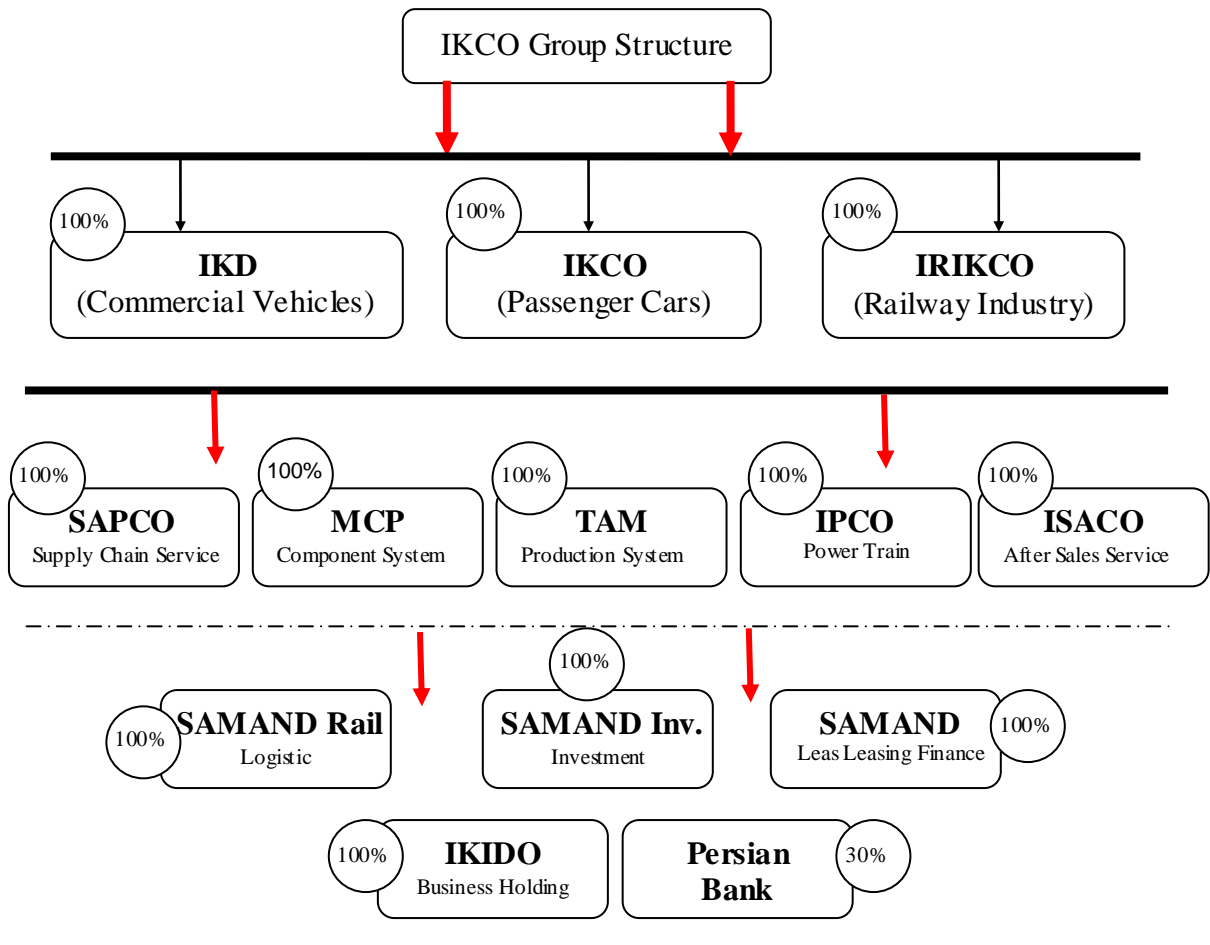
Figure 1: IKCO Group Structure
An Introduction to Iran Khodro Group (2013, p.4)

Table 17: Investments in shares of other companies (IKCO Internal Source)

Description	Number of shares	Investment %	Cost of investment M.$ 2008
IKIDO	1,188,160,000	79	125.07
Tolid Mehvar Khodro	90,000,000	30	9.53
Iran Khodro Diesel	374,896,890	23,43	45
Ahangari & Teractor Sazi Iran	5,999,999	15	3.64
Mehrcam Pars	120,621	-	0.02
SAPCO	150,000,000	100	192
Iran Khodro Khorasan	400,000,000	100	42.11
ISEICO	300,000,000	100	31.58
TAM	250,000,000	100	26.32
ISACO	22,000,000	100	40,53
Iran Khodro Engine Researches	89,400,000	100	9.41
Tosee Khodro Car	80,000,000	100	8.42
Iran Bearing & Bushing	65,000,000	100	11,17
Auto Integrated Parts Dubai	-	75.5	1.94
Saniran Auto	-	60	3.20
Iran Khodro Tabriz	230,000,000	51	24.21
Iran IT Communication Development	280,000	50	2.95
Bank Melli Leasing	49,999,800	49.9	5.26
Samand Investment	639,000,000	42,6	67,26
SIAMCO	-	40	6.98
Azmoon Jaddehei	1,050,000	35	1.11
Iran Khodro Fars	116,995,000	34	12.26
Shang Dang Young Man	-	30	5.46
Tosee Sanaye Khodro	301,522,000	26	31.74
Iranian Leasing	334,000,000	33.4	73.83
Varagh Khodro	81,900,000	23	8.62
IDEM	46,125,000	22.5	4.86
Ghalebhayeh Sanati Iran Khodro	515,680	16.5	8.06
Other Investments			64.69
Total other companies			683.97
Total			$867,021,000

(IKCO Internal finance report, 2011)

As highlighted previously, IKCO employs 53,000 personnel in total, meaning 22,000 employees are active only in the passenger car section in rundown plants in a massive complex. IKCO makes the Paykan's replacement, the Samand, as well as several Peugeot models. The plant is a city within a city and has its own postal code, train station, apartment blocks, schools, hospital, police station, post office, fire station and a college. "Production at plants was recently upgraded to three shifts, running at 95%

capacity and breaking only for religious holidays and the June anniversary of Ayat-Allah-Ozma Khomeini's 1989 death" (Ellis, 2006, p.1).

It is the biggest automaker in the country, the Middle-East, North Africa and Central Asia, and employs over 22,000 people in its passenger section. Moreover, it and plays a very important role in the country's auto market and economy. In addition, IKCO holds almost 50% of the domestic market in Iran in terms of units and is also known to be the world's 21st largest automaker (in terms of units) in the latest world rankings. As of 2013, IKCO produces 12 different models of cars. However, only three models that it produces, which are manufactured under IJVs, have achieved a very good quality ranking in the country's auto quality league table; there is a big gap in terms of quality between its locally managed and IJV managed products. Iran Khodro's historical background gives the opportunity for this research study to challenge the research objectives within IKCO. Tables 18– 22 on the following pages provide a brief insight into the IKCO's HR.

Table 18: IKCO Passenger vehicle production line employees only (2011)

	2009	2010	2011
1-Secondary School	1,841	1,593	1,565
2-High School	13,160	13,717	13,467
3-College Degree	2,683	2,765	2,744
4-BSc & BA	2,879	2,594	2,568
5-MSc & MA	636	620	616
6-PHD	56	57	57
Total number of employees	**21,255**	**21,346**	**21,073**

(Iran Khodro HR internal report, 2011)

Table 19: The number of employees in the R&D in IKCO (Design and NPD)

	IKCO (Employees)	Contract (Employees)
1-Secondary School Degree	25	2
2-High School Degree	82	0
3-College Degree (2 years College)	84	0
4-BSc & BA	225	0
5-MSc & MA	115	1
6-PHD	5	0
7- MSc / MA students	0	0
8- MSc / MA students	0	0
9-PhD students	2	0
Total number of employees	**538**	**3**

(Iran Khodro HR internal report, 2011)

Table 20: The IKCO's personnel breakdown from 2006-2010

Description	2006	2007	2008	2009	2010
Permanent	7.768	5.857	6.010	6.439	6.146
Contract	10.880	13.145	12.983	14.816	15.200
Total	**18.648**	**19.002**	**18.993**	**21.255**	**21.346**

(Iran Khodro HR internal report, 2011)

Table 21: The IKCO's personnel breakdown in passenger car section

	Under 5 years	5-10 years	10-20 years	20-30 years	30 years and above	Total
President's Office	359	243	143	29	3	777
VP Production	4,277	8,939	3,163	147	4	16,530
VP Strategy	431	536	365	68	12	1,412
VP Finance	93	80	86	23	0	282
VP Product and Quality	99	602	402	39	1	1,143
Other	305	370	447	76	4	1,202
Total	**5,564**	**10,770**	**4,606**	**382**	**24**	**21,346**

(Iran Khodro HR internal report, 2011)

Table 22: The IKCO's organisational levels

Description	Old	New 2011
Vice-President	6	4
Deputy	20	16
Director	79	58
Manager	237	0
Head	394	216
Administrator	491	357
Foreman	480	0
Group leader	0	521
Total	**1707**	**1172**

(Iran Khodro HR internal report, 2011)

A comparison study by BMI (2009b) showed that, interestingly, the Korean Hyundai Motor Company was established in the same year as IKCO, 1967. However, these two companies' profiles show a gap in terms of their car quality and production. BMI's (2009b) statistics show that IKCO is far behind Hyundai at the present time. In terms of units, for example, Hyundai has cited its product mix and an ability to diversify its overseas market as prominent factors in the 6.8% growth in its global sales in 2008. It sold a total of 2,796,370 units during the year, comprising 1,668,745 units produced in South Korea and 1,127,625 units produced overseas. Revenues were also up 5.1% Year-Over-Year (Y-O-Y) to KRW32.19trn. Performance in the first half of 2009 was excellent according to BMI (2009b), even in the middle of the global economic downturn. The company grabbed a 5% global market share for the first time and generated an excellent Q209 net profit of US$650mn, a rise of 48% Year-Over-Year. This came despite a 15% decline in the global demand for autos in H109, according to the company's own estimates. Mirzaei of Iran Khodro laments that, "Iran's stagnation as an auto power contrasts with the rise of Korea. In the 1970s, Koreans regarded IKCO as a developing-world model for their own new car industry. He mentioned that now IKCO and Iran are following Korean. He believes that if Iran did not have problems with the US, it could have a car industry at least like Korea" (Ellis, 2006, p.2). Even the gap between these two corporations in terms of car quality is wider. In addition, Sanat-e Khodro (2009, Shahriver) stated that an international car quality inspector (J.D. Power) said in 2009, that Hyundai could improve its cars' quality stand in the world car quality league table. Hyundai could improve 9 steps and could take Toyota's place in the rankings and become one of the top 4 auto manufacturers in the world in regard to its car quality. J.D. Power also mentioned that Hyundai had achieved the highest mark and success in terms of quality in middle-class car models. These aforementioned stories show a significant opportunity to work within and research the IKCO to establish the reasons behind these issues. However, IKCO is seeking to become an international automaker by setting-up networks in the neighbouring countries. Table 23 shows IKCO's sales

network in the global markets whilst Table 24 highlights IKCO's production sites in other countries.

Table 23: IKCO's sales network in global markets

MENA	EU/ America	Africa	Asia	CIS
Lebanon	Bosnia	Senegal	Afghanistan	Armenia
Jordan	Bulgaria	Algeria		Azerbaijan
Iraq	France	Egypt		Belarus
Saudi	Italy	Sudan		Georgia
Syria	Brazil	Tunisia		Kazakhstan
UAE	Venezuela			Russia
	Turkey			Tajikistan
				Turkmenistan
				Ukraine
				Uzbekistan

(Iran Khodro Annual Report, 2011)

Table 24: IKCO's Production sites overseas

No	Country	Activities
1	Azerbaijan	Samand Production (6,000 units)
2	Belarus	Samand Production (8,500 units)
3	Syria	Samand Production (30,000 units)
4	Egypt	Peugeot Pars Production (5,000 units)
5	Senegal	Samand Production (15,000 units)
6	Venezuela	Peugeot Pars Production (16,500 units)

(Iran Khodro Annual Report, 2011)

Since 2000, IKCO has been trying to gain access to the auto markets in the region and overseas by setting up sales, after sales and production sites in nearly 30 different countries on different continents. Iran Khodro's product basket includes the models mentioned in Figure 2. For more visual information, please see the photo chapter at the end of the thesis.

Figure 2: Iran Khodro's available passenger products

Paykan (Phased out)	Samand	ROA	L90	E Class	Vitara
Pick-Up	Soren	PARS			
	Serrier	206SD			
	LX	405			
	Runna	206			
		207i			
		405LX			

(Iran Khodro Annual Report, 2011)

Table 25 and 26 provide more detailed specific information about IKCO's products within the Ministry's league table.

Table 25: IKCO's productions in the quality league table (2009)

	productions	IJV	N (-) point	Domestic components %	
1	Suzuki Grand	Suzuki	-78.1	n/a	Very good
2	Peugeot 206 SD	Peugeot	-89.2	n/a	Very good
3	Peugeot 206	Peugeot	-89.6	61.74%	Very good
4	L90	Renault	-131.9	n/a	Good
5	Peugeot Pars (Khorasan site)	*	-178.1	90.46%	Good
6	Peugeot Pars (Tehran site)	*	-183.0	90.46%	Good
7	Peugeot 405 (Khorasan site)	*	-184.3	93.35%	Good
8	Samand	*	-186.3	90.73%	Good
9	Peugeot 405 (Tehran site)	*	-190.2	93.35%	Good
10	Peugeot Roa	*	-271.5	100%	Less acceptable
11	Peugeot 207i	Peugeot	n/a New	n/a New	n/a New

(Iranian standard & quality inspection, 2009, p.1)

Table 26: Explanation of N (-) point:

Year	Period	Quality Very Good	Quality Good	Quality Acceptable	Quality Less acceptable
2007	first 6 months	$0 \leq N \leq 160$	$160 < N \leq 450$	$450 < N \leq 600$	$600 < N \leq 800$
	2nd 6 months	$0 \leq N \leq 140$	$140 < N \leq 380$	$380 < N \leq 550$	$550 < N \leq 750$
2008	first 6 months	$0 \leq N \leq 135$	$135 < N \leq 320$	$320 < N \leq 460$	$460 < N \leq 650$
	2nd 6 months	$0 \leq N \leq 130$	$130 < N \leq 270$	$270 < N \leq 380$	$380 < N \leq 580$
2009	first 6 months	$0 \leq N \leq 125$	$125 < N \leq 230$	$230 < N \leq 300$	$300 < N \leq 480$
	2nd 6 months	$0 \leq N \leq 120$	$120 < N \leq 200$	$200 < N \leq 270$	$270 < N \leq 410$

(Iranian standard & quality inspection, 2009, p.2)

2.5. Conclusion

It has been stated that the automotive industry is one of the fastest growing industries within the global economy, and there are fewer places where this is more apparent than Iran. As a consequence of this, the Iranian government has identified the industry as one of its key pillars for economic growth and development, primarily by making the sector attractive to both local and overseas investors. However, results from Iran's automotive industries league table reveal that there is a distinct lack of effective knowledge/technology transfer techniques between domestic and international partners within the same organisation. In terms of car quality, foreign partners' experience, knowledge and expertise have had no influence (or not enough influence) on the improvement of the quality of local manufacturing production in IKCO. There is not enough knowledge sharing among the IJVs. It is important to establish how Iran's domestic automotive industry transfers its foreign partners' knowledge and experience effectively to its own local production line; therefore, the roles of prior knowledge, absorptive capacity and knowledge transfer in the new product development process will be the main areas of study in this research.

A review of Iran's auto industry background clearly shows that it has developed significantly from the import of a single vehicle from Belgium in 1920 to the numerous brands and models of different vehicles found in the market today. However, the results and outcomes of different research on the industry's performance show that the industry has spent time and money assembling other countries' vehicles without aiming to transfer its foreign business partners' technology and knowledge to local projects effectively; however, several other factors, such as political issues, product quality and privatisation, are also key elements that have affected the outcome of the industry. In 2000, Iran Khodro introduced the first national brand to the market; however, the main difficulty and issue across the industry is the quality of newly launched products. Although IKCO has forged many business partnerships with well-known automakers, such as

Mercedes-Benz, Talbot, Renault, Peugeot and Suzuki, over the past 50 years, it continues to experience difficulties in launching a reasonable vehicle to the market in terms of new product quality when compared with the products made within its IJV projects.

The evidence shows that IKCO has not been very successful in terms of introducing a reasonable good quality locally made vehicle and in this stage IKCO needs to improve its reputation by introducing high-quality products and services to the target market (locally or internationally). In order to be a global player IKCO needs to focus on quality improvement, customer satisfaction, managerial commitment and personnel participation. As mentioned previously, the attitude of the country towards the automotive industry indicates that there is a great opportunity for growth and improvement for auto makers in Iran.

CHAPTER THREE: LITERATURE REVIEW

3.1. Introduction

This chapter reviews the knowledge-based view of the firm and discusses the importance of knowledge management and some of its elements in the new product development process. This chapter will explore studies on knowledge-sharing within new product development processes, and will progress to identify the key mechanisms of knowledge-sharing in the existing literature. The potential contribution and outcome of this research is centred on investigating knowledge-sharing in the new product development process.

Companies often have a range of product lines and successively introduce new products over time. New products are consumer and industrial offerings made for the first time, but how many of these offerings are not really new. Ettlie (2006, p.365) believes that, "most new products are really not new to the world, sometimes they are copies of existing products, with only slight changes from the existing products. In most cases, these new products are not completely new for a company, both in terms of technologies and market concepts".

Successful new product development, therefore, depends at least partly on the ability to understand technological and market knowledge embodied in existing products, and on adopting this knowledge to support new product development (Insiti & Clark, 1994). In addition, Clark & Fujimoto (1991) argued that sometimes a fast product development cycle has become a critical foundation of competitiveness in industries such as automobile manufacturing. Under such circumstances, retaining and quickly utilising knowledge across generations of projects and learning from past development activities may become important both for avoiding unnecessary problem-solving and also in the discovery of new solutions to problems in the field of new product development. The capability to mobilise and create knowledge for

new product development has been stated as being critical for competitive advantage (Helfat & Raubitschek, 2000).

3.2.   Knowledge Management

There are many definitions of knowledge management in the existing literature. For example, Quintas *et al.,* (1997, p.387) define knowledge management as "the process of critically managing knowledge to meet existing needs and to identify and exploit existing and acquired knowledge assets and to develop new opportunities". In comparison, Nonaka (1991) argues that knowledge management covers a series of practices used within an organisation to identify, create, represent, distribute and enable acceptance of insights and experience. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organisational processes or practice. According to Barclay & Murray (1997), knowledge management makes a direct connection between an organisation's intellectual assets explicit (recorded) or tacit (personal know-how) and business results.

In addition, Gloet & Terziovski (2004) describe knowledge management as the formalisation and way into experience, knowledge and expertise that creates new capabilities, and supports innovation and the new product development process, which develops customer value. Most importantly, Darroch & McNaughton (2002) point out that knowledge management is a management function that creates or establishes knowledge, manages the flow of knowledge, and certifies that knowledge is used successfully and efficiently for the long-term benefit of the organisation and companies.

To comment on the importance of knowledge management, Alavi & Leidner (2001, p.112), in their paper, mentioned the results of two different surveys in an effort to highlight the importance of knowledge and knowledge management for organisations. "A survey found that almost half of the companies reported having

suffered a significant setback from losing key staff with 43% experiencing impaired client or supplier relations and 13% facing a loss of income because of the departure of single employee. The Second survey showed that much of the knowledge the organisation needed existed inside the firm, but identifying that it existed, finding it, and leveraging it remained problematic. Such problems maintaining, locating and applying knowledge have led to systematic attempts to manage knowledge".

According to Davenport & Prusak (1998), most knowledge management projects have one of three aims. Knowledge management helps to make knowledge noticeable, firstly by showing the role of knowledge within an organisation, mainly through knowledge maps, yellow pages or the development of a knowledge-intensive culture, by encouraging and combining behaviours, such as knowledge-sharing (transferring knowledge among members); secondly, by proactively seeking and offering knowledge; and finally, by building a knowledge communications system not only one that is technical in nature, but one delivering a web of connections amongst people for interaction and collaboration.

This thesis adopts the view that knowledge management is a process of capturing an organisation's collective expertise, whether it resides in databases, on paper, or in people's minds, and accordingly distributing it to wherever it can help produce the greater benefit (Hibbard, 1997). In addition, the thesis also views knowledge management as a process that helps to get the right knowledge to the right people at the right time so that they can make the best decision (Petrash, 1996). These knowledge management processes can be subdivided into creating knowledge within an organisation and transferring knowledge from either outside or within an organisation (Teece, 1998). The next sections will explore some key factors that could affect knowledge management process elements.

3.2.1. The Origin and Significance of the Knowledge-based View

In order to better understand the knowledge-based view, it would be helpful to understand the resource-based view, as the knowledge-based view is considered an extension of the resource-based view (Curado & Bontis, 2006). The resource-based view argues that firms with valuable, rare and unique resources have the potential to achieve better performance. These resources are inputs into a firm's production process (Barney, 1991). In addition, Wernerfelt (1995) believed that strategies that are not resource-based are unlikely to achieve a successful business environment.

A firm's resources, at a given time, could be defined as those physical and intangible assets, such as brand name, in-house knowledge of technology, employment of skilled personnel, trade contacts, machinery, efficient procedures and capital (Wernerfelt, 1984). Firm resources include all assets, capabilities, organisational processes, firm attributes, information, and knowledge controlled by a firm that enable the firm to conceive of and implement strategies centred on improving its efficiency and effectiveness (Daft, 1983; Barney, 1991). As has been stated, "the fundamental principle of the resource-based view is that the basis for a competitive advantage of a firm lies primarily in the application of the collection of valuable resources at the firm's body" (Wernerfelt, 1984, p.172).

Barney (1991, p.105) argued that, "to transform a short-run competitive advantage into a sustained competitive advantage requires that these resources are mixed in nature and not perfectly mobile"; in essence, "this translates into resources that are neither perfectly imitable nor substitutable without great effort" (Barney, 1991, p.117). The resource-based view explains that a firm's sustainable competitive advantage is reached by exclusive resources, with such resources encompassing the description of being rare, valuable, inimitable, non-tradable, non-substitutable and firm-specific (Barney, 2001). In addition, Grant (1996a, p.110) argued that "the resource-based view perceives the firm as a unique bundle of individual resources

and capabilities where the primary task of management is to maximise value through the optimal deployment of existing resources and capabilities, while developing the firm's resource base for the future". With this taken into account, a firm may reach a sustainable competitive advantage through the exclusive resources it holds; these resources cannot be easily bought, transferred or copied, and at the same time add value to a firm whilst being rare.

The main question that arises here is: how could organisations transform these valuable resources to benefit their performance? As Galunic & Rodan (1998) argued, the knowledge-based theory explores the ways in which firms combine and transform these valuable unique input resources into the final performance. In addition, Hitt *et al.,* (2008) also mentioned that knowledge has the most capacity of all resources because knowledge allows the firm to expect more precisely the nature and business-related potential of changes in the environment, and the appropriateness of strategic and tactical actions (Cohen & Levinthal, 1990). Without such knowledge, an organisation is less capable of realising and taking advantage of new opportunities (Wiklund & Shepherd, 2003). This thesis is framed within the knowledge-based view of the firm to identify the ways in which firms combine and exchange different kinds of knowledge particularly knowledge about new product development - into their final performance and actions. The knowledge-based view of the firm argues that knowledge is the most exclusive and unique resource, allowing an organisation to merge and manage the resources available to all in new ways, providing more value for its customers than its competitors (Kogut & Zander, 1992; Teece, Pisano & Shuen, 1997).

In addition, Foss, *et al.,* (2006) argued that the knowledge-based view may help to understand issues related to the boundaries in the internal organisation of the firm. The knowledge-based view of the firm directs special emphasis to the interactions amongst individuals and groups of knowledge-sharing and knowledge creation (like the development of routines), and finally the conclusion of such interactions for

competitive advantage (Grant, 1996). Developing a knowledge-based view of the firm raises the issue: what is knowledge? (Grant, 1996).

3.2.2. Types of Organisational Knowledge

Knowledge has been defined as an organisational asset with exclusivity and originality (Al-Alawi, *et al.*, 2007; Cabrera & Cabrera, 2002; Nonaka, 1994; Grant, 1996). In addition, Hislop (2005) and Bohn (1994) also identified a useful way of understanding knowledge, which can be achieved by differentiating it from what it is not. These two authors argued that one of the most important distinctions to be made in the current knowledge of literature is between knowledge, information and data. They identified data as raw numbers, images, words and sounds derived from study or measurement. This data could be the raw numbers and replies from a marketing survey of an organisation's clients. Information, in comparison, represents data arranged in a meaningful pattern; in other words, data where some intellectual input has been added, for example, where the raw data from the marketing survey has been analysed using a specific statistical technique in order to produce structured results.

Moreover, knowledge is more complicated than information. Lee & Yang (2000) argue that knowledge is the consequence and outcome of interpreting information based on personnel's understanding, which in turn is influenced by the personality of its holder since it is based on judgment and feeling, attitude and behaviour. Information is data organised into meaningful patterns. Information is transformed into knowledge when a person reads, understands, interprets, and applies the information to a specific work function. "Knowledge becomes visible when experienced persons put into practice lessons learned over time" (Lee & Yang, 2000, p.1).

In addition, Machlup (1982) believed that one person's knowledge could be another person's information. If a person cannot understand and apply the information to

anything, it remains just information. However, another individual can take that same information, understand it and adapt it in the context of previous experience, and apply the newly acquired knowledge to make business decisions or redefine a laboratory practice. However, a third person may take the same pieces of information and, through his/her unique experiences or lessons learned, apply knowledge in ways that the second person may never have considered. Nonaka (1994, p.15) concluded that "information is a flow of messages, while knowledge is created and organised by the very flow of information, anchored on the commitment and beliefs of its holder".

Knowledge becomes embedded in people's minds overtime; it is demonstrated through their actions and behaviours (Al-Alawi *et al.*, 2007). In a practical sense, knowledge can be measured as 'actionable information', which allows the organisation to make better judgments and provide an effective input to the new product development activity within organisations. Importantly, this happens by providing information in the right place, at the right time and in the appropriate format (Tiwana, 2000).

Explicit knowledge is knowledge that can be codified and documented (e.g., processes, checklists), whilst tacit knowledge is defined by Polanyi (1996) as knowledge that cannot be articulated or verbalised. It is embedded in the background and experience of an individual/personnel or a group. In addition, Spender (1996a) suggested that tacit knowledge could be understood best as knowledge that has not yet abstracted from practice.

Nonaka (1994) and Szulanski (1996) also explained that tacit knowledge exists either in the minds of individuals or a collective body, and has been acquired through experience. On the other hand, explicit knowledge is knowledge that is transmittable in formal, systematic language. It may include explicit facts, axiomatic proposition and symbols (Kogut & Zander, 1992), and can be codified or articulated in manuals, computer programs and training tools (Inkpen & Dinur, 1998).

As highlighted by Inkpen & Dinur (1998, p.456), "knowledge types, therefore, must be classified on a continuum that ranges from explicit knowledge embodied in specific products and processes to tacit knowledge acquired through experience and use and embodied in individual cognition and organisation routines". Knowledge that is tacit and highly personal has a slight value until it can be converted into explicit knowledge that other organisational members can share and use; however, such a conversion process exposes knowledge to the danger of imitation by other firms and competitors.

According to the aforementioned literature, the thesis has recognised tacit knowledge as unarticulated, intuitive, non-verbalisable, and always derived from personal experience. Moreover, it is subjective and difficult to formalise (Nonaka *et al.*, 2000), and is often learned via shared experiences. Furthermore, it is believed that learning knowledge that is tacit in nature requires participation and doing (Nonaka & Takeuchi, 1995). According to Polanyi (1966) and Pablos (2004), explicit knowledge is articulated either verbally or in writing. It can exist either individually or collectively, is documented, and can be transferred in a formal and efficient way through rules, policies and procedures. Explicit or codified knowledge is easier to use within an organisation as it can be easily transferred and shared within members and organisations.

A number of scholars have used the concept of explicit and tacit knowledge to categorise different forms of knowledge (Nonaka & Takeuchi, 1995), and a number of other scholars, such as Hansen (1999), have categorised knowledge into codified and non-codified knowledge. Hansen (1999) believed that codified knowledge is available in the form of written documents and procedures. However, Hansen (1999) argued that the main issue here is the level of codification; in other words, the level to which knowledge is fully documented or articulated in writing at the time of transfer between a sub-unit. Hansen (1999, p.87) argued that "knowledge with low

codification corresponds to notion of tacit knowledge is hard to articulate and can only be acquired through experience".

3.2.3. The Knowledge Management Process

Knowledge creation has been widely recognised as strategically important for organisational learning and innovation. Nonaka & Takeuchi's (1995) book *The Knowledge Creating Company* highlighted the complexity of knowledge creation, and its importance for an organisation's long-term success. They believed that knowledge is created only by individuals and that an organisation cannot create knowledge without individuals. However, the organisation could support creative individuals or provide contexts for them to create knowledge. Von Krogh (1998, p.133) argued that "the rapid creation and diffusion of knowledge within and between companies has become a top priority on managers' agendas". Nonaka *et al.,* (2006, p.1179) believed that organisational knowledge creation "is the process of making available and amplifying knowledge created by individuals as well as crystallising and connecting it with an organisation's knowledge system. In other words, what individuals come to know in their (work) life benefits their colleagues".

Nonaka (1994), Nonaka & Takeuchi (1995) and Spender (1996) have mentioned knowledge-creation in their work. Knowledge-creation is defined as "the capability of a company as a whole to create new knowledge, disseminate it throughout the organisation and embody it in products or services and systems" (Nonaka & Takeuchi, 1995, p.93). Nonaka & Takeuchi (1995) have suggested that knowledge is created through conversions between tacit and explicit knowledge; they proposed their well-known knowledge-creation model known as SECI (Nonaka & Takeuchi, 1995).

Nowadays, knowledge and the capacity to create and operate knowledge are considered to be the most important source of a firm's sustainable competitive

advantage (Nonaka & Takeuchi, 1995). Nonaka's (1994, p.14) theory of organisation knowledge-creation holds that "organisational knowledge is created through a continuous dialogue between tacit and explicit knowledge. Focusing on knowledge-transferring through the interaction between tacit and explicit knowledge identifies four modes: socialisation (tacit to tacit) represents the interaction between individuals through mechanisms such as observation, imitation or apprenticeships; combination (explicit to explicit) involves combining explicit knowledge through meeting and conversation or using information systems; internalisation (explicit to tacit) converts explicit knowledge into tacit knowledge; whereas externalisation (tacit to explicit) converts tacit knowledge into explicit knowledge". Figure 3 and Table 27 show categorisations of these above-mentioned elements:

	Dialogue		
Field Building	**Socialisation** (Tacit to Tacit)	**Externalisation** (Tacit to Explicit)	Linking explicit knowledge
	Internalisation (Explicit and Tacit)	**Combination** (Explicit to Explicit)	
	Learning by Doing		
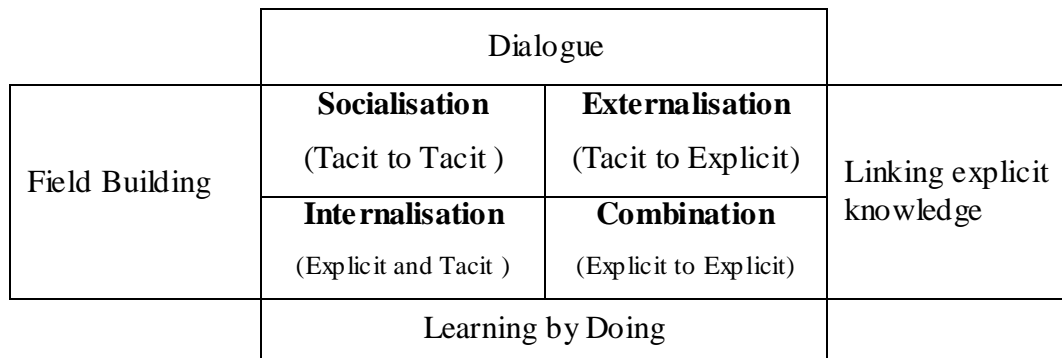
Figure 3: Model of Knowledge Creation
(Nonaka & Takeuchi, 1995, p.71)

Table 27: Knowledge creation modes

Knowledge creation	Degree of socialisation, externalisation, combination, and internalisation
Socialisation	Degree of tacit knowledge accumulation, extra-firm social information collection, intra-firm social information gathering, and transfer of tacit knowledge
Externalisation	Degree of creative dialogue, deductive and inductive thinking, use of metaphors, and exchanges ideas
Combination	Degree of acquisition and integration, synthesis and processing and dissemination
Internalisation	Degree of personal experiences, simulation, and experimentation

(Lee & Chio, 2003)

To examine the knowledge-creation process, this study will adopt socialisation, externalisation, combination and internalisation for two reasons. Firstly, these four models contain not only knowledge-transfer but also knowledge creation. Existing knowledge-transfer and new knowledge-creation are very significant in knowledge management (Tsai & Li, 2007). Secondly, the four above-mentioned models have been used widely in the context of organisational learning and new product development. Internalisation and externalisation modes of knowledge conversion relate to patterns of conversion involving both tacit and explicit knowledge. Such models show that tacit and explicit knowledge are complementary and can expand over time through a process of mutual interaction (Lee & Choi, 2003). In addition, Marwick (2001) believes that these processes do not happen in isolation, but work together in different combinations in typical business situations. Table 28 shows some examples of technology that may apply to facilitate knowledge creation processes (Marwick, 2001):

Table 28: Knowledge creation facilitators

Tacit to Tacit: • E-meetings • Synchronous collaboration (Chat)	**Tacit to Explicit:** • Answering question • Annotation
Explicit to Tacit: • Visualisation • Brows able video/audio of presentations	**Explicit to Explicit:** • Text search • Document categorisation

Marwick (2001, p.816)

Szulanski (1996) believes that knowledge-transfer is important both within a firm and between different firms as the success of many organisations can be based on their ability to transfer the knowledge embodied in organisational routines from one organisation unit to another, as well as to improve their capabilities by assimilating new technology.

In addition, Ford (2001) believes that the knowledge management field covers several areas, the most commonly discussed of which is knowledge-transfer. Knowledge-transfer within and between organisations gives opportunities to departments and members of the organisation to learn from other parts of the organisation (McElroy, 2003; Edmondson, *et al.*, 2003). Gupta & Govindarajan (2000) defined knowledge-transfer as the transfer of skills, technologies, business practices and data between organisational subunits. They believed knowledge flows to be the transfer of know-how, which can be composed of expertise or developing and transferring knowledge effectively, which is a major and key challenge for all businesses. In addition, Schulz (2001) also recognised knowledge-transfer as the joint volume of know-how and information-transmitted per unit of time. Moreover, Kalling (2003) identified knowledge-transfer as a process by which an organisation makes knowledge routines available to its members. Valuable ideas can arrive from inside or outside the company, and can then be used in the market. This transaction of ideas is one of the key elements of operating a successful new product development process. Cohen & Levinthal (1990) showed that knowledge-transfer is a key factor for a firm, and is necessary to rapidly respond to changes, innovate and achieve competitive success. With these definitions, this study intends to capture the overall amount of know-how and information transmitted between subunits in all kinds of ways, including via telephone, e-mail, regular mail, meeting and shared technology. Knowledge-transfer needs an individual or a group to work together with others to transfer knowledge, achieve common benefits and learn from each other (Syed-Ikhsan & Rowland, 2004). However, it is important to assure employees that they will have access to all of the necessary information that they might need (Jones, 2007). 'Knowledge-transfer is viewed as the process through which one unit is affected by the experience of another' (Argote & Ingram, 2000, p.151). The basic question is: what steps can organisations take to make knowledge-transfer a more effective process? Each organisation is different, and there are many practical tools for transferring knowledge across different teams and departments (Jones, 2007). For

example, the transfer of technological know-how is facilitated by communication, visits and meetings (Bresman *et al.*, 1999).

In addition, Bornemann & Sammer (2003) argued that knowledge can boost and increase its value when transferred to and shared with others; the basic notion is that the transfer of viable knowledge should assist with collaborative problem-solving between people, directly and indirectly, supported by networks and tools. Transferring knowledge between units and people can create significant learning benefits. When an individual is willing to help out as well as to learn from others in the development of new competencies, to 'learn' means to digest, to absorb, and to apply (Senge, 1998), which can be referred to as the level of absorptive capacity. Modern information and telecommunication technology is available to support such exchanges across time and distance barriers. Organisations investing in this type of technology often face difficulties in terms of encouraging their employees to use the system to transfer and share their ideas (Cabrera & Cabrera, 2002). For long-term success, organisations should always be able to learn, benefit from the knowledge they attain, apply it to reality, and increase their knowledge about developing a new product, which is the result of a successful knowledge-transfer (Liedtka, 1999).

In the existing literature, knowledge-transfer occurs at various levels: between individuals; from individuals to explicit sources; from individuals to groups; within groups; between groups; and finally, from a group to the whole organisation (Alavi & Leidner, 2001). Moreover, Wakefield (2005) believes that the transferring of knowledge between individuals and departments in an organisation is considered a key process of learning. In addition, Ardichvili *et al.,* (2003) point out that this knowledge can either be generated within firms (intra) or accessed externally (inter). It has been argued that the transfer of tacit knowledge is more difficult to accomplish than the transfer of more articulated knowledge (explicit knowledge). Inside a multiunit organisation, units can learn from each other and benefit from new knowledge developed by other units. Knowledge-transfer amongst organisational

units provides these opportunities for mutual learning and inter-unit cooperation that motivate the creation of new knowledge, whilst at the same time giving organisational units the ability to innovate (Tsai & Choshal, 1998).

Empirical research by Foos *et al.,* (2006, p.1) showed the way in which the organisation can measure the success of its tacit knowledge-transfer. "A qualitative research based on 13 interviews was designed with various individual representing three companies. The research suggested that trust, early involvement and due diligence influence the extent of meeting technology transfer expectations and tacit knowledge-transfer expectation". In addition, Szulanski (2003) found that most difficulties in transferring largely tacit knowledge are a result of the recipients lacking the experience to make effective use of the new ideas and having relationship between the source and recipient. Moreover, Dayasindhu (2002) added that there are difficulties associated with identifying the specific original tacit knowledge that needs to be transferred. Smith *et al.* (2007) showed that the most knowledge-transfer takes place informally between individuals. Since much important organisational knowledge resides in tacit form, the individual is central to any effort to improve this type of knowledge-transfer (Nonaka & Takeuchi, 1995). Bock *et al.,* (2005) believe that it is necessary to understand tacit knowledge-transfer from an individual's point of view in order to plan and put into practice knowledge management programmes that will effectively meet the organisation's knowledge management.

"Knowledge-transfer is viewed as dyadic exchanges of organisational knowledge between a source and a recipient unit in which the identity of the recipient matters" (Szulanski, 1996, p.28), or "knowledge-transfer is viewed as the process through which one unit is affected by the experience of another" (Argote & Ingram, 2000, p.151). Finally, knowledge-transfer happens only when the adopter uses the shared knowledge (Darr & Kuzberg, 2000). In such cases, knowledge-transfer is essentially built on the source and recipient. Most organisations are interested in particular types of tacit knowledge-transfer, which provide value to their organisations and members.

Whilst this list is not necessary comprehensive, it does cover the majority of tacit knowledge. Table 29 on the following page summarises these four models' characteristics and introduces a simple explanation, including Best practice, Expertise, Experience and Innovation (Smith *et al.*, 2007)

Table 29: Categorisation of tacit knowledge transfer

Best Practices	• The goal with this type of knowledge transfer is to capture and leverage existing knowledge, not to generate new knowledge. This means reusing what others have already learned. • To enable this kind of transfer, organisations often produce detailed documents and templates to guide others in what to do and how to do • People do not want to take the time to write down what they have done, do not want to use the materials made available to them or do not want copy the work of others
Expertise	• Companies have only a small number of experts in a particular area and look for ways to grow others as rapidly as possible. • Expertise is the result of combining specific skills with experience in using them. Developing expertise requires practising the skills in a variety of situations and then being able to apply and adapt them appropriately to achieve successful outcomes. • Traditionally, expertise takes a long time to develop. • Clearly, companies could therefore benefit if they could find ways to develop expertise more rapidly
Experience	• Experience is a mixture of lessons learned, cognitive assessments, relationship and preconceived ideas, which combined with intelligence, transform information into usable knowledge. • Experience is considerably more than technical expertise and is essential to understanding and correctly interpreting information coming into the organisation from the outside. • Access to managerial experience is critical
Innovation	• Companies not only want to stimulate the development of new ideas, they also want to motivate their people to become more responsive to change. • Facilitating this type of knowledge transfer is the biggest challenge for an organisation • Innovation is predicated on the ability to integrate new information with existing knowledge to create something new. • It is difficult to transmit innovative ideas within organisations in ways that they can be understood and acted upon.

(Smith *et al.,* 2007)

Since the literature suggests that key features of knowledge-transfer are knowledge movement and the application of knowledge, this study captures both of these ideas by defining knowledge-transfer as the communication of knowledge from a source so that it is learned and applied by a recipient. The objective of this knowledge-transfer section is to establish and examine the way in which firms acquire tacit knowledge from partner firms, and how the extent of inter-firm tacit knowledge-transfer affects a firm's innovation capability and performance. Schulz (2001) measured knowledge-transfer with a multi-item instrument that asked informants to rate how much knowledge their subunit provided to other units; it was found that learning processes do affect knowledge-transfer. Cavusgil *et al.,* (2003) found that tacit knowledge could be gained from partner firms through their interactions. Tacit knowledge-transfer makes an important contribution to firms for developing innovation capability. Firms' combined experience also plays an important role in tacit knowledge-transfer. Firms with greater mutual experience can benefit more from this tacit knowledge-transfer. The moderating role of firm size on that relationship was also explored. The higher the degree of tacitness of firm knowledge, the harder it was to transfer it from one firm to other. Some factors that could influence knowledge-transfer are mentioned and categorised in Table 30.

Table 30: Factors influenced knowledge transfer

Innovation performance	Measured by three items. They measure if the innovation project has succeeded in achieving its main objectives; financial and ROI
Innovation capability	Measured by five items. They use frequency of innovation, order of market entry, and simultaneous entry into multiple markets. The ability to penetrate new markets to tap the various facts of innovation capability.
Extent of tacit knowledge Transfer	Measured by four items. They are used to capture the Complexity, Codifiability, and Observability of the information transferred.
Relationship strength	Measured by three items. These are the frequency of infractions, confidence in each other, and the desirability of maintaining the relationship.
Collaborative experience	Measured by four items. Three items represent the overall experience on information cooperation, contractual agreement, and consortia. One item measures the overall collaborative experience.
Firm size	Measured by annual sales volume and number of employees.

(Cavusgil *et al.,* 2003)

Cavusgil *et al.,* (2003) showed that relationship strength considerably influences the level of tacit knowledge-transfer. The result also supported that inter-firm relationship strength affects tacit knowledge-transfer. The extent of tacit knowledge-transfer positively affects firm innovation capability. According to the knowledge-based view of a firm, an organisation's capability to create knowledge is a foundation of competitive advantage (Kogut & Zander, 1992; Spender, 1996) and, as highlighted previously, knowledge-creation, as based on Nonaka's model, is about continuous transfer, mixture and conversion of the different types of knowledge (tacit and explicit) where personnel practise and learn. However, Cook & Brown (1999, p.385) believe that "tacit knowledge cannot be turned into explicit, nor can explicit be turned into tacit". Yet, Cook & Brown (1999) argue that using each type of knowledge can help the acquisition of the other type. Nonaka & Takeuchi (1995, p.59) describe individual tacit knowledge as the basis of organisational knowledge creation. "Knowledge is created only by individuals. An organisation cannot create knowledge without individuals. The organisation supports creative individuals or provides contexts for them to create knowledge. Organisational knowledge creation, therefore, should be understood as a process that organisationally amplifies the knowledge created by individuals and crystallises it as part of the knowledge network of the organisation". Other scholars, such as Doz (1996); Crossan (1999); and Inkpen & Dinur (1998), have supported Nonaka & Takeuchi's view, and provided development of the process. For example, Zollo & Winter (1999) mentioned that organisational knowledge-creation can be seen as a process that is dependent on the group and individuals building up new knowledge and experiences, sharing knowledge with others, and codifying knowledge so that it is accessible and useable by other organisational members and can be reserved in the organisational memory. However, Cook & Brown (1999, p.386) argued that, "individuals and groups each do epistemic work that the other cannot". Cook & Brown (1999) also suggested that both tacit and explicit knowledge are shaped through a process of dynamic communication with the outside world.

3.2.4. Summary of Knowledge Management

It has been clearly argued that knowledge can be considered the most exclusive, strategic and unique resource for an organisation. In addition, authors such as Kogut & Zander (1992), mentioned that the ability to obtain, combine, store and share, and apply 'knowledge' is the most important capability for building a successful final performance. Gupta & Govindarajan (2000) defined knowledge-transfer as the transfer of skills, technology, business practices and data between organisational subunits. The main objective of this research is to explore and clarify the problems and issues that might affect knowledge-creation and knowledge sharing /transfer (skills, knowledge, experience and data) between one location and other parts of an organisation. Nonaka (1994) argued that organisational knowledge is created through a continuous conversation between tacit and explicit knowledge. Nonaka *et al.,* (2006) defined organisational knowledge-creation as a process of making available and amplifying knowledge created by an individual as well as crystallising and connecting it to the organisation's knowledge system.

3.2.5. From Knowledge to New Product Development

According to Plessis (2007), the nature of global economic growth has been changed by the speed of new product development, which has been made possible by rapidly evolving technology, shorter product lifecycles, and a higher rate of new product development.

Leiponen (2006, p.238) believed that "the growing literature on the knowledge-based view of the firm argues that a firm's practices towards the generation of knowledge can have a substantial effect on their final performance". In addition, Shani *et al*., (2003) mentioned that the fundamental nature of new product development is the creation, utilisation and exploitation of new knowledge and business sustainability, which is embedded in the firm's ability to manage its new product development

process. In addition, Herkema (2003) argued that new product development is a process wherein knowledge is acquired, shared and taken on board, with the aim of creating new knowledge, which embodies products and services.

In particular, Plessis (2007) defined the new product development process as the creation of new knowledge and ideas to facilitate new business outcomes, aimed at improving the internal business process and structures, and creating new market-driven products and services. He argued that the first basic driver of knowledge management's role in NPD in today's business environment is to create, build and keep competitive advantage through the utilisation of knowledge through collaboration (JVs) practices.

Cavusgil *et al.,* (2003) indicate that building and sustaining a new product development process has, however, become increasingly complex due to changing customer needs, extensive competitive pressure and rapid technological change. Knowledge management and new product development process configuration determine the way in which a firm can capitalise on and create new knowledge, providing a context wherein new product development efforts are designed, developed and completed (Shani *et al.*, 2003)

3.3.   New Product Development as a Knowledge-creation Process

Johne & Snelson (1988) believe that product development is very important for the future of firms who want to grow by internal or external means. Ansoff's directional policy matrix (Table 31) introduces four important factors that play a central role in a business's successful growth. The new product development strategy can be seen to be one of the main factors in the organisation's growth and success in the Ansoff matrix.

Table 31: Ansoff matrix

	Current products	New products
Current markets	1) Market penetration strategy	3) Product development strategy
New markets	2) Market development strategy	4) Diversification strategy

(Stone, 2001, p.51)

Trott (2005) argued that almost all companies try to ensure that their products are able to compete with the competition by frequently improving and updating their existing products. Lovelace *et al.,* (2001) believed that levels of competition that resulted from the globalisation of markets and repeatedly changing technologies, such as the internet - which lessens the effects of distance - have heightened the need for businesses to continually innovate products and processes, and increase the speed of their delivery to the market. Delivering a new product is thus a leading business challenge for most organisations (Tornatzky & Fleischer, 1990).

New product development success is largely decided by the way in which a firm appreciates, develops and promotes a new product. Traditionally, the new product development process has been portrayed as proceeding in an orderly, logical fashion from product idea to launch. The success or failure of a new product has been found to be determined by the various steps and activities that characterise a new product project as it moves from the idea stage to a commercialised new product (Cooper, 1983). NPD is a key area that has been identified in terms of understanding the way in which products are developed, and how they are ultimately brought to the marketplace (Lim *et al.*, 2003).

3.3.1. NPD Process (Historical Development)

Trott (2005, p.383) argued that, "new products are the outputs of the innovation process, where the new product development (NPD) process is a sub-process of innovation. The actual development of new products is the process of transforming a new business opportunity into a tangible new product" and transferring this business opportunity into the end performance is mainly integrated with knowledge management performance. Erez & Naveh (2004, p.1575) argued that, "there is new product development management under way all the time in organisations; some fail, some work and only a few make history. In today's competitive marketplace, companies that want to survive should produce and sustain high-quality products and service".

A successful innovation that ends in a successful new product is very important to maintain companies' business and it is important to a growing new business (Chesbrough, 2003). In addition, Tidd *et al.,* (2006) argued that being innovative has become one of the most important factors for organisations in terms of satisfying their competitiveness. The innovation process is concerned with the various activities that have to be undertaken in order to turn an innovation into a successful commercial new product or service, which consumers, individuals or firms will purchase. This section will explore the nature of this process and in particular the various activities involved in the exploitation of innovations to make them into commercially viable new products and services.

Hart & Baker (1994) argued that the field of new product development (NPD) is widely researched in a variety of organisations, such as universities, consulting firms and manufacturing companies, and can be identified in a wide range of regulations, including technology management, business policy, marketing and engineering. In order to be successful in the new product development process, a firm should simultaneously meet two critical aims: maximising the fit with market knowledge or

customers' needs, and minimising the time to market (fast knowledge creation and fast knowledge-transfer to the final output). Saren's well-known taxonomy (1984), in which new product development process models are categorised, is a useful basis upon which the new product development process will be reviewed and examined.

3.3.1.1. Departmental-stage model:

The department stage model, as mentioned in Figure 4, shows that departments hold responsibility for the various responsibilities carried out. For example, in an industrial circumstance, the ideas are equipped and originate in the R&D department. The detailed design is then carried out by the design department. The engineering department will then make the prototype, after which production will become involved to work on the manufacturing problems, and finally marketing will become involved to plan and carry out the launch.
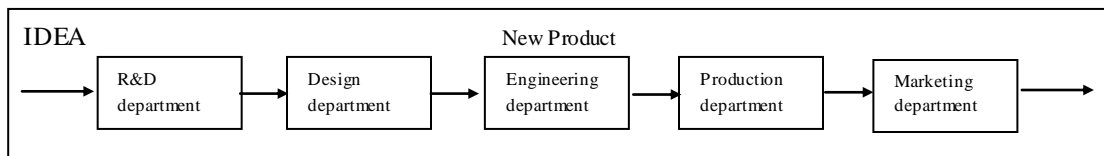
Figure 4: Example of a department-stage model
(Saren, 1984, p.13)

A new idea moves from its concept as an idea through a variety of departments, one after another, until it finally emerges into the market as a newly developed product. In this model, there is a lack of feedback source from market knowledge: as Cooper (1984) believed, there is nothing in the way of market feedback, since marketing is presented with the product to market. Every department performs a specific task, through which an idea is developed into a concrete result. It moves from one department to the next until it emerges as a new product, which is then introduced in the market (Figure 4).

3.3.1.2. Activity-stage model:

Trott (2005) believed that activity-stage models (Figure 5) are similar to departmental-stage models, but because they stress the activities conducted they provide a better representation of reality. They also facilitate repetition of the activities through the use of feedback loops something that departmental stage models did not. Activity-stage models are also referred to as over-the-wall action. Over-the-wall models are the same as departmental-stage models, so called because departments would carry out their tasks before throwing the project over the wall to the next department. Figure 5 shows an activity-stage model:
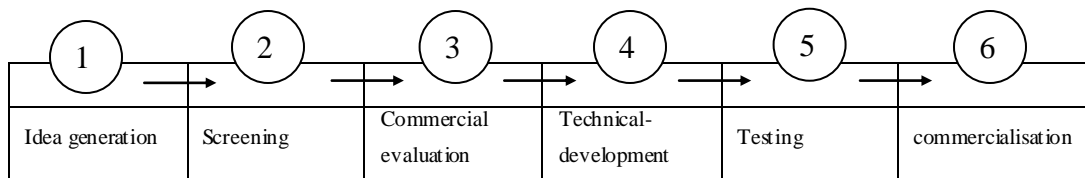
Figure 5: Activity-stages in the NPD process
(Baker & McTavish, 1976; Booz, *et al*., 1982, cited in Jong, *et al.,* 2007)

In the activity-stage model (as mentioned in Figure 5), the NPD process includes six stages where in each some particular action is carried out. Step Three involves the application of commercial estimates regarding possible costs, prices and sales of the resulting new product. In Stage Four, a prototype is developed which is tested in Stage Five. The final stage comprises activities, such as development for production, test marketing, and launch. In this model, the basis for the identification of the different 'stages' is the type of activities involved in each. Activity-stage models are the most widely recognised models to describe NPD. Cooper (1984) and Saren (1984) focused on the actual development activities carried out to develop a new product. The NPD process is broken down into a number of activities conducted sequentially. Various activity-stage models have been proposed, all of which focus on different types of activity that vary in the degree of time and effort spent on each stage.

The most famous activity-stage model, developed by Booz & Hamilton (1982), is shown in Figure 6. Most studies suggest a version of this model for NPD purposes (Johne & Storey, 1998). Activity-stage models present NPD as a gradual process of reducing uncertainty through a series of problem-solving stages, moving through the phases of scanning and selecting through to implementation (Figure 6).
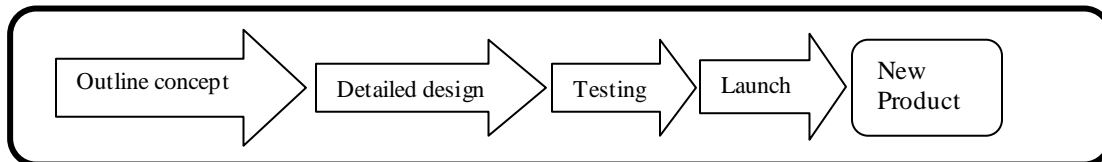
Figure 6: Example of activity-stage model
(Tidd *et al.*, 2006)

The main advantage of activity-stage models is that they specify the task needing to be conducted. However, the tasks are performed sequentially, which may lead to long development lead times, communication problems and increased costs. Integrating the various activities in the innovation process is a way of overcoming these problems. The various steps can overlap (Clark & Fujimoto, 1991).

3.3.1.3. Decision-stage model:

Hart & Baker (1994) argued that activity-stage models improve on departmental-stage models in that they focus on the actual activities carried out, including various iterations of market testing. However, they have been criticised for continuing a pass-the-parcel approach to NPD since such activities are still seen to be the responsibility of separate departments or functions (Takeuchi & Nonaka, 1986).

Cooper & Kleinschmidt (1986) and Kotler (1997) all argued that decision-stage models represent the new product development process as a series of decisions that need to be taken in order to progress the project. Much like activity-stage models, many of these models also facilitate iteration through the use of feedback loops. However, a criticism of these models (activity and decision) is that such feedback is implicit rather than explicit. The importance of the interaction between functions

cannot be stressed enough and the use of feedback loops helps to emphasise this (Trott, 2005). Cooper (1983) and Ronkainen (1985) believed that decision-stage models represent the NPD process as a series of evaluation points, where the decision to carry on or abandon the project is made.

3.3.1.4. Conversion-process model:

Twiss (1980) viewed new product development processes as a 'conversion process', transforming inputs, such as raw materials, scientific knowledge and manpower, into outputs and new products. Conversion models provide a view of product development as the transformation of inputs (such as raw materials) into outputs (such a new product). Figure 7 shows the NPD conversion process.
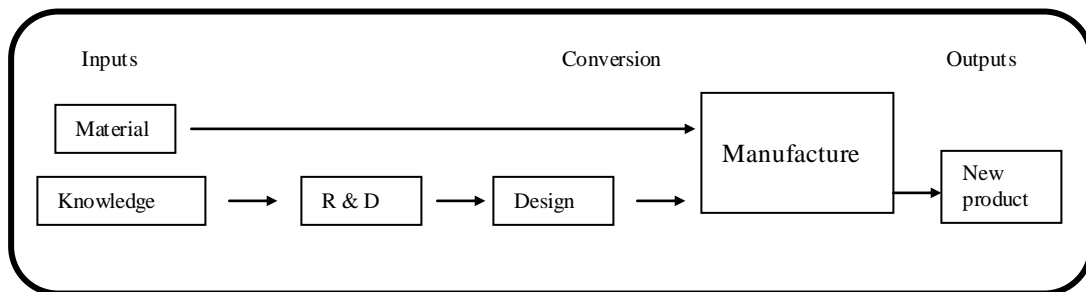
Figure 7: NPD process as a conversion process
(Twiss, 1980; Saren, 1984)

3.3.1.5. Response models:

This model focuses on the individual's, or organisation's response to a new project proposal or new idea, or R&D project proposals in terms of acceptance or rejection of the idea or project. A number of factors influencing the decision to accept or reject the proposal are helpful in terms of the extent to which they provide a new angle on what might otherwise be called the screening stage of the NPD process. A response model is a model that accounts for the fact that organisations respond to changes in their environments, and place emphasis on stimuli from the environment that need to

perceive a response that needs to be developed and then worked out (Hart & Baker, 1994).

3.3.1.6. Cross-Functional Teams (CFTs):

Griffin (1997) argued that companies gradually rely on consisting of members from R&D, marketing, manufacturing and sales for the purpose of their business. Competitive forces have made cross-functional teams the method of choice through which high-technology organisations generate and deploy new products and processes (Keller, 2001). It is clear that cross-functional groups consist of members from different functional areas with different knowledge, such as various research disciplines, including electronic, metallurgy, engineering, manufacturing or marketing. Denison *et al.,* (1996) pointed out that cross-functional teams are spreading rapidly in organisations as they attempt to improve coordination and integration (Ford & Randolph, 1992; Knight, 1976), and cut cycle times in new product development (Takeuchi & Nonaka, 1986). They bring together people from different disciplines and functions that have pertinent expertise regarding the proposed new developed product problem (Kanter, 1988). Such teams have a high absorptive capacity, as their members' differing expertise allows them to tap into a broad collection of external information and new knowledge (Cohen & Levinthal, 1990). It is clear that, in NPD process, a cross-functional team is a group of people with different non-practical/practical expertise working towards a common goal. Typically, it includes employees from all levels of an organisation. Members may also come from outside an organisation (in particular, from suppliers, key customers, or consultants. CFTs often function as self-directed teams responding to broad, but not specific directives.

The advantages of CFTs are that a combination of individuals with different expertise can also facilitate creativity (Woodman *et al.*, 1993). Marketing and manufacturing representatives in new product teams, for example, could facilitate product transfer or handoff of the newly developed product to manufacturing for

distribution (Griffin, 1997), where speed to market is likely to be increased (Lovelace *et al.*, 2001). However, Ford & Randolph (1992, p.278) made a number of criticisms of the CFT model. They categorised their views into eight critical areas:

1. "Violates single line of authority and authority equal to responsibility principles of organisation
2. Creates ambiguity over resources, technical issues, pay, and personnel assignments
3. Creates organisational conflict between functional and project managers.
4. Creates conflict among individuals who must work together but have very different backgrounds and perspectives on work, time horizons, and goals.
5. Creates insecurity for functional managers and erodes their autonomy.
6. More costly for organisation in terms of overheads and staff, more meetings, delayed decisions, and information processing
7. More costly for individuals in terms of role ambiguity, conflict and stress
8. Show response time to multinational issues" (Ford & Randolph, 1992, p.278).

3.3.1.7. Network models

Trott (2005) argued that network models suggest that NPD should be viewed as a knowledge-accumulation process that requires contributions from a wide range of sources. The network model in Figure 8 helps to highlight the accumulation of knowledge over time.

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┌─────────────────────────────────────────────────────────────────────────┐
│ ┌───────────────────────────────┐     ┌──────────────────────────────┐   │
│ │ External inputs:              │     │ External inputs:             │   │
│ │ Societal needs, Competitors,  │     │ Competitors, Suppliers,      │   │
│ │ supplier partnership,         │     │ distributors, customers      │   │
│ │ distributors, customers,      │     │                              │   │
│ │ strategic alliances           │     │                              │   │
│ └───────────────────────────────┘     └──────────────────────────────┘   │
│                                                                           │
│      ┌────────────────────────┬────────────────────────┐                 │
│      │  ┌──────────────────┐  │  ┌──────────────────┐   │                 │
│      │  │ Marketing and    │  │  │ Finance          │   │                 │
│      │  │ sales            │  │  │                  │   │                 │
│      │  └──────────────────┘  │  └──────────────────┘   │                 │
│      │            ⬭ Accumulation of                      │                │
│      ├───────────── knowledge over time ─────────────────┤                │
│      │                                                   │                 │
│      │  ┌──────────────────┐  │  ┌──────────────────┐   │                 │
│      │  │ Engineering and  │  │  │ Research and     │   │                 │
│      │  │ manufacturing    │  │  │ development      │   │                 │
│      │  └──────────────────┘  │  └──────────────────┘   │                 │
│      └────────────────────────┴────────────────────────┘                 │
│                                                                           │
│ ┌───────────────────────────────┐     ┌──────────────────────────────┐   │
│ │ External inputs:              │     │ External inputs:             │   │
│ │ Competitors, suppliers,       │     │ Scientific and technological │   │
│ │ distributors, customers,      │     │ developments, Competitors,   │   │
│ │ university departments        │     │ Suppliers, Customers,        │   │
│ │                               │     │ University departments       │   │
│ └───────────────────────────────┘     └──────────────────────────────┘   │
└─────────────────────────────────────────────────────────────────────────┘
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Figure 8: A network model of NPD
(Trott, 2005, p.404)

The next section will summarise all of the above-mentioned models in three simple categorisations of the NPD process, and will also highlight each model's strengths and weaknesses, bridging the gap between knowledge management (KM) elements and the NPD processes.

3.3.2. Types of NPD

Hobday (2005, p.126) argued that, "each different NPD model captured the academic knowledge of the time and summarised perceptions of best practice. Each model served as a foundation for more sophisticated models allowing the incorporation of

additional factors relevant to the NPD process. Each model creates useful insights and hypotheses into the nature of the NPD process and decision making requirement at the level of the firm, pointing to important links between the NPD process and other key process within the firm (e.g. marketing, manufacturing, management) and external to the firm (e.g. the science and technology environment, universities and government policies)". Most recently, McCarthy *et al.* (2006) acknowledged that NPD progresses through a series of stages, but with overlaps, feedback loops, and resulting behaviours that resist a linear analysis.

3.3.2.1. The linear model of NPD process

As McCarthy *et al.,* (2006, p.439) argued, "the linear NPD process frameworks stem from traditional and logical project management methods that seek to deliver appropriate outputs on time and within cost". They interpreted the process of new product development as a series of actions and performance, which are sequential and discrete in nature. In addition, Cooper & Kleinschmidt (1986) argued that these process of control and competence are based on the cooperation, coordination and communication of those involved in the NPD process. Muffatto & Roveda (2000) and Shepherd & Ahmed (2000) all argued that linear frameworks attempt to explain how process behaviour affects product quality, execution of key tasks, product development costs, product reliability, product variety and managerial complexity.

The best-known framework based on the linear view is the stage-gate method (Cooper, 1990), which represents NPD as a sequential and ordered process of 4–5 stages of activity and decision; these include concept development, product design, testing and validation and product launch. The inputs into the system are new ideas and market needs; the system elements are resources, such as engineers and marketers; and the outputs are the new products (Clark & Wheelwright, 1993).

Between the stages are gates or checkpoints, where the movement and output of the previous NPD process stages are evaluated. McCarthy *et al.,* (2006) believed that,

the advantage of this model is that it provides a simple and effective representation of the structural logic and flows, suited to incremental new product development process activity with relatively reliable market push or strong market pull forces. However, this model does not consider the dynamic behaviours and relationships associated with agency, freedom and resulting innovations. Soren's departmental-stage and activity-based models can be seen under a linear model, where carrying out similar characteristics.

Under linear models, the NPD process can be seen as a series of activities, carried out one after another. Hobday (2005, p.128) believed that, "linear models underestimate the innovation process, especially in the early stages when a new concept is being generated and tested. Sometimes the model makes marketing and market research integral to the NPD process, for example, by pointing the importance of interaction between marketing and R&D". However, much like the pure technology push models, they aim to ignore other important aspects of the innovation process, including the working relationship with customers, feedback loops from later or earlier stages and interaction with the science and technology environment. Most researchers have seen consumer (market) knowledge as an advantage, targeting many new product development processes (Wood & Lynch, 2002).

Knowledge-transfer between departments in linear models is not clearly identified; the departments are working in an isolated environment and passing their project to the next department without real communication. In the case of a linear model, it is difficult to say what is going on within each stage in the different departments. Knowledge-transfer from outside the unit is not important and is not recognised as a key factor. All R&D activities are processed internally, and feedback loops from later to earlier stages are not really recognised or identified. The concept of organisational learning does not generally develop, as there is no real knowledge-transfer and knowledge creation process within the departments and individuals

inside the organisation during the NPD processes in a linear model. Individuals are working in a remote environment within their own department, passing their activities to the next department without feedback from their neighbours.

3.3.2.2. The coupling model of NPD process

The coupling model is a highly simplified but nevertheless more representative model of the NPD process. Unlike in linear models, the coupling model explicitly links the decision-making of firms to the science and technology community and to the marketplace. The "coupling model is non-linear with feedback loops. For example, in the 1980s, following observations of developing new products in Japanese automobile companies, integrated or parallel models began to be developed that involved significant functional overlaps between departments and/or activities. These models attempted to capture the high degree of cross functional integration within firms as well as their external integration with activities in other companies including suppliers, customers and, in some cases, universities and government agencies" (Hobday, 2005.p.125).

The coupling model is a major improvement on earlier models, and explicitly and/or implicitly attempts to address some of their weaknesses, as outlined previously. Unlike earlier models, feedback from the different stages is recognised (e.g. research, technical evaluation, engineering development, market research, sales and distribution). Interaction between individuals and departments within the organisation during the new product development process is recognised; however, the main criticism of this model is that it does not really deal sufficiently with environmental factors (e.g. science and technology and governmental regulations).

Basic knowledge-transfer and knowledge creation models are common in the coupling model; mostly, these knowledge-transfer and knowledge creations are internal between departments and individuals and external knowledge and sources have no role in the coupling model of the NPD process.

3.3.2.3. The interactive model of NPD process

Soren's response models and network models have been categorised under interactive models. Forrest (1991, p.444) argued that, "the modern organisation (particularly the modern high technology firm) needs a model which integrates all the faces of the innovation process that should be recognised by those responsible for facilitating innovation within the firm. Such a model should be of use throughout the life of the organisation, from the young entrepreneurial firm in an infant industry to the highly integrated organisation in a mature industry, and should be applicable to both product and process development".

Interactive models emphasise the learning that goes on within and between firms. In interactive models of NPD, 'time' is one of the key elements and factors for the companies' success. Being first in the market leads a company to adopt a position as a main player in the business field. In the interactive model, members of different functional areas work together (e.g. members of marketing, engineering, finance, R&D); this team has the advantages of the multiple sources of data, knowledge, experience and expertise of its members. However, communication between different departments and members is one of the main difficulties in this model. Most importantly, the interactive model emphasises the external linkage between CFT members and outside sources, such as knowledge and technology. Within the interactive model, internal and external sources adopt a very important role in NPD process success. Some characteristics of the new product development models are introduced in Table 32.

Table 32: Model of NPD process

Models	Characteristics
The linear model of NPD process	- Simple linear model, emphasis on internal R&D push. - The market will be forced to accept the result of the R&D. OR - Emphasis on marketing. - The market is the source of ideas and providing direction to R&D - There is no feedback loop
The coupling model of NPD process	- With feedback loops from later or earlier stages - Involves push or pull-push combination - R&D and marketing more balance - Emphasis is on integration at the R&D – marketing interface - Parallel development with integrated development teams - Emphasis on integration between R&D and manufacturing - Horizontal collaboration including joint ventures and partnership
The Interactive model of NPD process	- Fully integrated parallel development supported by advanced I.T - Use of R&D expert - Horizontal linkages including joint ventures - Collaborative research grouping - Collaborative marketing arrangement - Emphasis on corporate flexibility and speed of development (time-based-strategy) first - Increased focus on quality and other non-price factors

The Interactive model is a major improvement on its earlier models. In this model the adoption of information technology (IT) is recognised. However, there are negative features of IT, such as high costs, difficulties in learning, and unrealistic claims. In this latest model, knowledge-transfer between external knowledge and internal knowledge is as important as internal knowledge-transfer and internal sources. Knowledge-transfer between internal R&D and external R&D is recognised. The main characteristic of this latest model is that it recognises networks between departments and organisations and creates effective knowledge-transfer and knowledge creation between individuals and departments.

3.3.3. R&D as the Hub of Knowledge-sharing in the NPD Process

"Research and development knowledge is created via a process by which information and know-how are shared and combined through various exchanges" (Henard & McFadyen, 2006, p.41). R&D members are the knowledge-intensive and expert group in an organisation; their knowledge and expertise is very important to new product development, and their ability is the major strength of the product development strategy (Henard & McFadyen, 2006). In addition, Jokinen (1998) argued that R&D's work is dependent on the skills, knowledge and experiences of the team and R&D team members can learn from each other and apply their past experiences and skills to solve new issues (Zhuge, 2002).

The R&D centre can be seen as a hub that gathers all possible and useful knowledge (from internal or external sources and tacit and explicit knowledge) in an effort to facilitate the new product development process within an organisation. Nevertheless, the question is posed: how can this knowledge collected from different sources within the R&D centre be kept for further use?

Nonaka (1991) argued that knowledge management activities cover a series of practices used within an organisation, centred on identifying, creating, storing, representing, distributing and enabling the adoption of insights and experience. Such insights and experience cover knowledge both embodied in individuals and embedded in organisational processes or practices. In an attempt to understand organisational knowledge better, a distinction between tacit and explicit knowledge is useful. Tacit knowledge was defined by Polanyi (1962) as knowledge that is non-verbalisable, intuitive and unarticulated. Nonaka (1994) also argued that tacit knowledge is highly context specific and has a personal quality, which makes it difficult to formalise and communicate. On the other hand, Kogut & Zander (1992) defined explicit knowledge as knowledge that is transmittable in formal, systematic language and may include explicit facts, axiomatic propositions and symbols. It is

important to identify how an organisation can store and gather such different forms of knowledge.

Walsh & Ungson (1991) identified organisational memory as stored information, data and knowledge from an organisation's. This information and knowledge is stored via the individual's recollections and shared understanding, which appear as a result of applying specific decisions. For example, information about customers is a knowledge repository of customers' backgrounds, and a group of skilled people is a knowledge repository of tacit knowledge. Jashapara (2004, p.116) also identified a knowledge repository as a "data warehouse that holds a vast amount of information from a wide variety of sources. The data warehouse needs to serve as neutral data storage that can be used for a variety of analytical tools".

However, Nonaka & Takeuchi (1995) argued that a key challenge for organisations is the conversion of tacit knowledge into explicit knowledge. Knowledge that is tacit and highly personal has little value until it can be converted into explicit knowledge that organisational members can share and use. Spender (1996) argued that individuals have knowledge that is practical, and organisations have knowledge that constitutes the socialisation and social activities of the individuals within them. Individuals always gain knowledge, share it with their organisational community, and thus increase the collective store of knowledge, while maintaining a common individual knowledge with their co-workers. Spender believes that explicit knowledge stored in knowledge repositories - standard operating procedures, manuals and so on - is referred to as objectified knowledge.

Besides knowledge-sharing, knowledge re-coding and categorisation within the repository has also become recognised as important. For example, "when asking a question to an expert, a customer service or admin operator tries to classify the customer query into one of X different categories for which experts are available, or similarly a question on the web (Yahoo answer) can be automatically forwarded to a

restricted group of people with a specific expertise". Knowledge can be obtained from different sources and can be structured, unstructured, labelled and unlabelled by Yahoo and Wikipedia, as rapidly growing datasets hold articles organised by titles, subjects, writers, years" (Gupta & Ratinov, 2008, p.842).

Now the main function of the R&D is to generate new knowledge by recombining existing tacit and explicit knowledge (Kogut & Zander, 1992); this kind of knowledge recombination can be from inside, outside or across organisation. However, Santos *et al.,* (2012, p.27) argued that, "there are always knowledge-sharing barriers in the context of R&D projects. Knowledge-sharing barriers in such contexts include codification, inadequate IT to support knowledge-sharing, lack of initiative and strategy by the workers, lack of time and suitable resources, communication barriers, and the interdependence of knowledge and skills between partners and participants". All of these affect knowledge-sharing within the organisation and departments. Jashapara (2004, p.185) believes that "the failure of many knowledge management systems is often as a result of cultural factors rather than technological".

Nonaka (1994, p.16) argued that, in the literature, "little attention has been paid to how knowledge is created and how the knowledge creation process can be managed". Now we know the difference between tacit and explicit knowledge, and as Polanyi (1966, p.4) argued, "we can know more than we can tell". Polanyi categorised human knowledge into two groups. He categorised the first group as explicit or codified knowledge that is transmittable in formal, systematic language, and the second group he named tacit knowledge, which has a personal quality that makes it difficult to formalise and communicate. Nonaka (1994, p.16) argued that, "tacit knowledge is deeply rooted in action, commitment, and involvement in a specific context". It is better to recall Nonaka's (1994) four knowledge conversion models and to apply these within the R&D knowledge repository. As mentioned previously, within R&D there are existing experts, skills (tacit), documents, maps

and manuals (explicit), all of which help R&D to create new knowledge. Nonaka (1994, p.18) argues that, "the assumption that knowledge is created through conversion between tacit and explicit knowledge allows researchers to suggest four different models of knowledge conversion:

A) From tacit knowledge to tacit knowledge (Socialisation)
B) From explicit knowledge to explicit knowledge (Combination)
C) From tacit knowledge to explicit knowledge (Externalisation)
D) From explicit knowledge to tacit knowledge (Internalisation)".

As already mentioned, socialisation (tacit to tacit) is sharing knowledge in both official and unofficial ways, and there is the possibility of face-to-face meetings, immediate communication, emails, chats, collaboration elements and social network applications. Internalisation (explicit to tacit) is the sharing and allocation of knowledge within the organisation. In this model, every member of the organisation can access the information on the internet or knowledge repositories and, as Nonaka & Takeuchi (1995) mentioned, it is closely related to learning by doing.

Combination (explicit to explicit) is the easiest form of knowledge conversion, and it can be achieved through the use of emails, collaboration tools and knowledge databases. Finally, externalisation (tacit to explicit) is the process whereby tacit knowledge is transformed into explicit forms. Nonaka (1994, pp.19–20) argued that, "metaphor plays an important role in the externalisation process and 'action' is deeply related to the internalisation process. Externalisation mode is triggered by successive rounds of meaningful 'dialogue'. In this dialogue, the sophisticated use of metaphors can be used to enable team members to articulate their own perspectives, and thereby reveal hidden tacit knowledge that is otherwise hard to communicate. Concepts formed by teams can be combined with existing data and external knowledge in search of more concrete and sharable specifications".

Moreover, as noted by Jashapara (2004, p.201), "Externalisation involves the articulation of tacit into explicit knowledge. This conversion normally occurs through dialogue and use of figurative language, metaphors, narratives, images and creative inference. The main characteristic of this artefact is dialogue where individuals share their mental models and their own understanding".

In terms of explicit knowledge-sharing and the role of IT as a main facilitator, APQC carried out a benchmarking study in 1997, for some 28 organisations, on the use of IT to support knowledge management activities. APQC (1997, p.6) believed that, "it is no coincidence that information technology for easily connecting people and information has blossomed at the same time that knowledge is becoming recognised as the most valuable of firm's assets. As information technology (IT) has become our personal desktop tool and our link to each other, we grow to covet even more access to information and people's knowledge. In turn, we demand even better IT tools, ones that become part of the way we work".

Borghoff & Pareschi (1997) and Davenport & Prusak (1998) also believed that information technology supports knowledge management activities effectively. Information and communication technologies, such as the internet, intranet, and software and hardware, are all instrumental in terms of improving the knowledge management activities in organisations. In addition, Dougherty (1999) believed that IT could also be seen as a tool to help the process of knowledge management in organisations. Egtbu & Botterill (2002, p.134) concluded that, "IT can be essential for the storage of explicit knowledge in databases and repositories but also as a communication device, through e-mail systems and groupware. The empirical evidence suggests that IT is used to a certain extent within organisations".

Davenport et al., (1998) and Gourlay (2001) argued that the concept of knowledge management has been effectively controlled by information technology, and that the role of individuals in the knowledge management processes is also growing rapidly

(Earl, 2001; Stenmark, 2001). Active communication means that a number of people exchange information and knowledge about the experiences they have gained in the past from their job, and other colleagues can learn from these experiences. However, converting tacit knowledge to explicit knowledge is often time-consuming and problematic (Davenport & Prusak, 1998). In addition, Nonaka & Takeuchi (1995) argued that explicit knowledge is less important for competitive advantage because technological improvements allow competitors to quickly replicate such data. O'Hagen & Green (2002, p.50) argued that, "today, explicit knowledge can move across the world quickly and cheaply, and technologies such as the internet allow people to access explicit knowledge around the world instantaneously". However, as already mentioned tacit knowledge is highly personal and can be transferred through face-to-face contact.

There are a number of elements, such as cultural, technological and organisational factors, that affect knowledge-transfer within and between organisations. Mudambi & Navarra (2004, p.385) argued that, as a cultural issue related to knowledge-sharing, "having valuable and unique knowledge gives power to the knowledge holders and can be used as a powerful tool within the organisation when there is a need for bargaining and negotiations within and between departments and organisations". The knowledge holder will aim to keep his/her knowledge for further use rather than share it with other organisational members and share his/her own power with others. Bacon (2011, p.6) described knowledge as a power for the knowledge holder, and stated that, "power at work is the same as power in a battery; more voltage, more impact and your knowledge represents what you know and what you can do. It embodies your talent, skills, abilities, wisdom and accomplishments".

At an organisational level, Yan & Gray (1994) argued that knowledge of the local business is usually a key resource of local partners and a key source of bargaining power, as it makes the foreign partner dependent on the local partner. However, as a foreign partner increases its knowledge of the local market, instability of the

partnership/IJV becomes possible; the reason for this is that the foreign partner captures the local partner's knowledge and decreases their level of dependency on the local partner's knowledge, thus gaining bargaining power. On the other hand, Inkpen & Beamish (1997, p.188) also argued that the "local partner may acquire the skills and knowledge of its international partner, making the IJVs redundant, as the international partner's skill and knowledge are no longer needed".

The concept of trust between organisations and within members becomes important when knowledge is going to be shared. Renzl (2008, p.206) argued that, 'the influence of interpersonal trust in general and trust in management in particular on knowledge-sharing is evident. Trust in management increases knowledge-sharing through reducing fear of losing one's unique value and improving willingness to document knowledge", whilst McEvily *et al.,* (2003, pp.92–93) argued that, "trust makes decision making more efficient by simplifying the acquisition and interpretation of information and also guides action by suggesting behaviour and routines that are most viable and beneficial under the assumption that the trusted counterpart will not exploit one's weakness".

Cook & Wall (1980, p.39) identified trust as "the extent to which one is willing to ascribe good intentions to and have confidence in the words and actions of the people", and Mayer *et al.,* (1995, p.710) highlighted a need for "developing mutual trust in order to enable members of an organisation to work together more effectively".

Levin *et al.,* (2002, p.2) clearly categorised two specific types of trust involved in the knowledge-sharing process within an organisation as "benevolence-based and competence-based trust; when most people think about trust, they are typically thinking of its benevolence-based form in which an individual will not intentionally harm another when given the opportunity to do so. However, the second type of trust that plays an important role in knowledge-sharing is competence-based trust which

describes a relationship in which an individual believes that another person or other party is knowledgeable about a given subject area and either type of trust can exist independently within an organisation". Moreover, Argote *et al.,* (2003, p.576) argued that "the fit between properties of knowledge, properties of work group, and properties of relationships between work groups are crucial for knowledge-sharing", whilst McEvily *et al.,* (2003) mentioned that the level of trust between members or two organisations influences the level of knowledge-sharing. Referring back to Nonaka's model (1994), and the issues and highlighted by different scholars surrounding the knowledge-sharing process, it has been seen that the role of top management support (TMS) in both tacit and explicit knowledge-sharing within the organisation is evident. How to make a connection between individuals within the organisations has been recognised as one of the key elements in terms of successfully managing knowledge (McDermott, 1999).

"Top management engages in behaviours such as becoming involved in decisions about project issues, monitoring project progress, facilitating information and knowledge flows to the project and generally showing supportive behaviour" (Green, 1995, p.223).

Factors such as motivation, reward, encouragement and organisations' regulations on storing and sharing knowledge play a central role in the top management support factor. For example, Rajan (1998), cited in Scarborough *et al.,* (1999), explained that the need for rewards is a personnel need among members, which could be decided by top managers. In addition, Marisa & Yusof (2011) also believed that managers, as the key staff, have an important role to play in terms of maintaining personnel's performance. Motivation is embodied in the psychological processes of asking for direction, giving direction, and increasing the behaviour to do something in order to achieve goals (Mitchell, 1982).

Desouza (2003, p.86) argued that, "top management support needs to be present and vocal. Two crucial reasons why organisations are unable to effectively leverage knowledge are because of a lack of commitment of top management to sharing organisational knowledge and the absence of role models who exhibit the desired behaviour. The Top manager must act as a catalyst or enabler through setting examples, engendering trust, instilling a cohesive and creative culture and establishing a vision".

3.3.3.1. Vertical and horizontal knowledge-sharing:

Referring back to the historical development of the NPD process mentioned earlier, knowledge-sharing can be seen in two main forms during these processes: firstly, vertical knowledge-sharing can be seen across different levels within a single department such as exchanging knowledge between R&D members; and secondly, horizontal knowledge-sharing can be seen between different departments, such as knowledge exchange between the R&D and Marketing departments.

3.3.4. Inter-organisational Knowledge-sharing

Lane *et al.,* (2001) argued that international joint ventures have become a widespread type of entry into foreign markets. International joint ventures are a way for overseas businesses to enter a new market faster but with lower risks. Learning has always been recognised as one of the main motivations of joint venture establishment, and scholars such as Lane *et al.,* (2001), Khanna *et al.,* (1998), Simonin (2004) and Chrysostome *et al.,* (2013, p.88) have argued in the past that, "joint ventures permit acquisition of new know-how and consequently present a good setting for the development of strategic competencies". Nevertheless, joint ventures are not always a perfect answer to tacit knowledge acquisition. On the one hand, joint ventures are an exceptional setting for successful learning; however, on the other hand, expected learning may not take place, and the collaboration between the joint venture partners

may result in several conflicts relating to power, cultural differences or personal interests (Beamish, 1988).

Lewis (1990) and Makino *et al.,* (2007) argued that the failure rate of JVs is far higher than the success rate and, in addition, learning within IJVs remains a difficult adventure owing to cultural, institutional and geographical distances. However, nowadays, organisations are developing more complex networks of communication with their partners. Organisations must have a good strategy to retain, develop, organise, transfer and utilise their resources; this requires systematic knowledge management, which has a significant influence on a firm's strategy formulation and performance (Grant, 1996; Zander & Kogut, 1995).

Vance & Eynon (1998) and Hansen *et al.,* (2005) believed that knowledge-transfer occurs when an organisation wants to increase performance of knowledge creation, and Ahmad & Daghfous (2010, p.155) argued that, "knowledge-transfer happened when a unit of an organisation is impacted by the experience or the know-how of another unit and this Knowledge-transfer can be practised in two areas: externally or internally. Companies regularly engage themselves in external knowledge-transfer activities such as training sessions, workshops, seminars, consulting, research and development activities, university courses, conferences, trade shows, government extension programs, and consortiums". On the other hand, Hansen *et al.,* (2005) argued that companies also "engage themselves in internal activities of knowledge-transfer such as in house training, mentoring and departmental reporting". The variety of benefits accrued through joint ventures is categorised in Table 33.

Table 33: Potential benefits of Joint Venture

1	Economies of scale
2	Access to complementary assets
3	Cost or risk sharing
4	Shaping the scope and basis of competition

(Koh & Venkatraman, 1991)

Inkpen (2008, p.448) showed how IJVs in the automotive industry in the USA could work well with positive feedback, by stating that, "a JV between GM and Toyota is an excellent case in which to study alliance learning and knowledge-transfer. The narrow scope of the alliance (vehicle assembly only) provided a manageable research site. The evidence of knowledge-transfer to GM is the improvement in manufacturing productivity and product quality at GM. In 2002, GM surpassed Ford for the first time in the 13-year history of the influential. Also in 2002, GM became the first US carmaker to rank in the top three of the J.D. Power and Associates' annual Initial Quality Study, which measures customer complaints in the first 90 days of ownership and a key factor in GM's improved quality is knowledge-transferred from Toyota to GM, according to *Gary Cowger*, GM VP. "The root of our improvement is the Toyota Production System [TPS]. We learned from them [Toyota] and we have got to give credit where credit is due".

However, as has been acknowledged previously, there is always the risk of losing one side of a JV, with Yan & Gray (1994) voicing the view that the local partner's knowledge makes the foreign partner dependent on the local partner; however, as th foreign partner increases its knowledge of local market, the instability of the IJVs becomes possible. The reason for this is that the foreign partner captures the local partner's knowledge and decreases their level of dependency on the local partner's knowledge. On the other hand, Inkpen & Beamish (1997, p.188) argued that the local partner may acquire the skills and knowledge of its international partner, making the IJV redundant, as the international partner's skill and knowledge are no longer needed. Table 34 categorises the factors influencing IJV performance.

Table 34: Factors influencing IJVs performance

Background variables This group contains factors shaping the domain of the venture partners	• Intra-partner characteristics • Inter-partner fit • International business experience • Trustworthiness credentials (relational history) • Affinities conducive to cooperation • Adequate resources • Towards achieving common benefits
Antecedent variables This group concerns the structure of IJV development	• Venture demographics (The age parental status of the IJV) • Contractual elements (governing the formal IJV agreement) • Managerial characteristics (objective attributes of IJV managers) • Subjective qualities such as experiential knowledge & interpersonal skills
Core variables This group contains strategic factors	• R&D strategy (technologically and commercially suitable, attention to R&D intensity) • Product Strategy • Market strategy • HR strategy
External variables Variables over which executive have little or no control	• Industry characteristics • Regulatory environment
Outcome variables	• Financial assessment • IJV stability • Multidimensional assessment, where drives IJV performance facets (market and financial outcomes together with inputs and throughputs such as employee morale and knowledge acquisition

(Robson, *et al.,* 2002, pp.395-697)

Besides the above-mentioned factors, elements such as absorptive capacity, learning and organisational performance become important for running successful IJVs. Cohen & Levinthal (1990, p.128) argued that, "the ability of a firm to recognise the value of new, external information (in this case external information from foreign partner), assimilate it, and apply it to commercial ends is critical to innovative capabilities, which are labelled as a firm's absorptive capacity and suggest that it is largely a function of the firm's level of prior knowledge". Lane *et al.,* (2001, p.1139) argued that, based on Cohen & Levinthal (1990), "first, trust between an IJV's parents and the IJV's relative absorptive capacity with the foreign parent are

suggested to influence its ability to understand new knowledge held by foreign parents. Second, an IJV's learning structures and processes are proposed to influence its ability to assimilate new knowledge from those parents and finally, the IJV's strategy and training competence are suggested to shape its ability to apply the assimilated knowledge". The final result of Lane *et al.,*'s (2001) studies suggested that trust and management support from foreign parents are associated with IJV performance but not with learning.

3.3.4.1. Trust between partners, and the ability to understand the foreign partner's knowledge

Trust at an organisational level is a vital part of absorptive capacity as it encourages the 'teacher' organisation to actively support the 'student' organisation to understand the knowledge it is offering. This is only likely to happen if the teacher is confident that its partners are dependable and will fulfil their duties (Johnson *et al.*, 1996). In addition, Inkpen & Beamish (1997) argued that willingness to risk weakness is one of the dimensions of trust. In this case, the condition for using and sharing valuable and hidden information and tacit knowledge is a key factor. Barney & Hansen (1994) also mentioned the confidence that another party not under your control will refrain from exploiting your vulnerabilities. Chiles & McMackin (1996) argued that, the greater the trust in the relationship between the IJVs, the greater the inclination for the parties to share and exchange information that may make them vulnerable. Lane *et al.,* (2001, p.1143) argued that, "most researchers on learning in IJVs and other learning collaborations have implicitly assumed that each organisation has a certain ability to learn from other organisations. However, evidence shows that an organisation's capacity to learn is not absolute but rather varies with the learning context". Parkhe (1993) found that differences in partner nationality and culture will negatively influence the success of the IJV, mainly in terms of the ability to benefit from the knowledge that can be transferred from the other partner.

3.4.   Knowledge Management Context

It is better to recall Quintas *et al.,'s* (1997, p.387) definition of knowledge management as, "the process of critically managing knowledge to meet existing needs and to identify and exploit existing and acquired knowledge assets and to develop new opportunities". In addition, Nonaka (1991) argued that knowledge management covers a series of practices used within an organisation to identify, create, represent, distribute and enable acceptance of insights and experience. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organisational processes or practice. According to Barclay & Murray (1997), knowledge management involves making a direct connection between an organisation's intellectual assets explicit (recorded) or tacit (personal know-how) and the business results.

3.4.1. Institutional/Macroeconomic and Organisational Contexts

As North (1990) asserts, institutions provide society with a structure for human behaviour by imposing constraints on the range of acceptable conduct. This can be achieved directly and most visibly through the rule of law and property rights, but also indirectly through common codes of practice and informally agreed modes of behaviour. In other words, institutions establish the basis for individual and collective behaviour in society. A number of different institutions impact on society drawn from different spheres of interest and activity. North (1990) mentioned three main spheres: economic, political and social. Henisz & Delios (2002, p.340) provided clarification for these spheres, suggesting that the institutional environment, "includes political institutions such as the national structure of policy making, regulation and adjudication; economic institutions, such as the structure of the national factor markets and the terms of access to international factors or production; and socio-cultural institutions, such as information norms". Likewise, Dacin *et al.,* (2002) argued that the majority of market activities are arranged based on the

existing institutions, embedded in economic, political and cultural arrangements. Institutions in this sense provide the framing point for society establishing the norms of behaviour.

Oliver (1997) pointed out that organisations and firms are just as subject to the influence of institutions as are individuals, and argued that, "from an institutional perspective, firms operate within a social framework of norms, values, and taken-for-granted assumptions about what constitutes appropriate or acceptable economic behaviour" (1997, p.699). In a similar vein, Zucker (1987, p.443) also asserts that, "institutional theories of organisations provide a rich, complex view of organisations. In these theories, organisations are influenced by normative pressures, sometimes arising from external sources such as the state, and at other times arising from within the organisation itself, and under some conditions these pressures lead the organisation being guided by legitimated elements, from standard operating procedure to professional certification and state requirement, which often have the effect of directing attention away from task performance". The organisation and the individual are influenced by the institutional spheres of the economic, the political and the social.. This is not to say that there is a simple one-way process at work from institutions to organisations; rather, there are complex two-way processes at work in which organisations (and individuals) are also able to influence the institutions themselves. However, this is likely to be a slow and evolving process (North, 1990).

One implication of this is that the shape and influence of institutions will vary from country to country. This will promote varying norms of 'acceptable' behaviour. Some countries may need to change their institutional arrangements in order to compete effectively in a global market (Rondinelli & Behrman, 2000). Ferretti & Parmentola (2010, p.175), for example, have argued that, "governments can promote realisation of knowledge spill over only if they create the condition for improving the absorptive capacity of local firms and the connection between local firms and foreign investors. Moreover, in many emerging countries, governments are directly involved

in relationships with the foreign investors through state-owned companies and this can be seen the Iranian case studies clearly". In addition, Cummings (2003, p.1) reasoned that, "the literature identified a number of primary contexts that can affect successful knowledge-sharing implementations, including the relationship between the source and the recipient, the form and location of the knowledge, the recipient's learning predisposition, the source's knowledge-sharing capability and the broad environment in which the sharing occurs".

Hillman *et al.,* (1999) argued that political ties could help organisations to gain key regulatory resources. Political connections provide firms with essential access to policy and industrial information; Suchman (1995) argued that political ties develop an organisation's political legitimacy. In addition, Sheng *et al.,* (2011) believed that political legitimacy helps organisations to receive special governmental treatment. However, in emerging countries, such as Iran, political aspects can control state-owned organisations very easily. Nevertheless, political exchanges in such a country could also cause policy changes, such as changes ushered in as a result of the Iranian Revolution.

3.5.   A Brief Review of Knowledge Management in Iran

An empirical work by Akhavan and Jafari (2008) showed that in Iran, knowledge management is positively linked to organisational duty, which means that organisations with knowledge-based missions need knowledge management more. However, Abdolshah and Abdolshah, (2011, p.173) argued that, the "knowledge management concept in Iranian institutions is almost a new subject and this concept in Iran has grown slowly and as a result, the research findings showed that a significant number of organisations have never used it and this caused their inefficiency and ineffectiveness". In addition, an empirical work by Soleimani *et al.,* (2013, p.3487) showed that, the "knowledge management context has not been institutionalised in many Iranian organisations".

Hassan *et al.,* (2013, p.427) believe that based on their empirical studies, "the influence of the key factors of knowledge management have an important role in the effectiveness and improvement of the implementation of knowledge management in the regional companies in the north of Iran". Khammarnia and Ramandi (2013, p.265) believe that "knowledge management has a relatively desirable status among their Iranian case studies and within their case studies it will be helpful for the managers to develop strategies for successful implementation of management techniques and processes".

The final result of Khammarnia and Ramandi's (2013) research showed that among their case studies, knowledge management elements such as knowledge acquisition and knowledge creation had received less attention among their participants. Abdolshah and Abdolshah, (2011, p.174) argued that Iranian companies "have not grown much in this regard and they have issues in the initial principles of implementing successful knowledge management". In conclusion, as Abdolshah and Abdolshah, (2011) argued, there is not enough evidence or studies concerning the barriers to knowledge management in Iran. Therefore, the following sections will

aim to identify some of the key factors related to this study that effectively facilitate and influence the knowledge management elements in Iranian institutions and industries.

3.5.1. Information Technology and Iranian Knowledge Management

As already stated, information technology effectively influences knowledge management factors such as knowledge creation or knowledge transfer and also permits people to access knowledge around the world easily (Davenport *et al.,* 1998; Gourlay, 2001; O'Hagen and Green, 2002). Borghoff and Pareschi (1997); Davenport and Prusak (1998) argued that information technology enables knowledge management activities to be carried out effectively and in addition, the level of information and communication technology usage has a positive effect on knowledge sharing behaviour. However, research findings within the Iranian organisation showed that information technology has a limited role in knowledge management processes among Iranian firms.

An empirical study by Akhavan and Jafari, (2008, p.19) showed that, "Iranian SMEs look at IT as a tool for facilitating some of their work and processes and not as an important enabler for knowledge management". Yet, researchers such as Farhanghi *et al.,* (2013) and Valaei and Aziz (2012) believe that within Iranian organisations information technology could have a direct and indirect impact on organisational performance and as a result, the lack of information technology within organisations could pose a risk to knowledge management processes (Davenport *et al.,* 1998; Gourlay 2001).

Iranian organisations are trying hard to develop their information technology stand. For example, "A report showed that Iran moved up considerably, 14 places, to rank 78 in the ICT Development Index from 2002 up to 2007". However, Gerami (2010, p.329) believes that "this improvement is not enough as compared to western and

other developing countries in the Index (e.g. 1.Sweden, 2. South Korea, 3.Denmark, 4.Netherlands, 5.Iceland, 10.UK, 25.Estonia, 48.Chile, 72.Armenia, 76.Jordan, 77.Oman and 78.Iran)".

However, the World Bank believes that information technology expenditure per capita in Iran has been increasing year-by-year since 2002 till 2009 (Trading Economics, 2013). In conclusion, the Iranian managers believed that the greatest advantage of IT is concerned with the reduction of human effort. 100% of the managers acknowledged the need for further promotion of their skills in a wide variety of IT issues" (Moghaddam *et al.,* 2013, p220).

3.5.2. Top Management Support and Iranian Knowledge Management

Top management support is recognised as one of the important factors for knowledge management, and this is especially the case in organisations where management takes a more active and direct role in the business and decision making (Lyles and Salk, 2007). Sweeney and Hardaker (1994) believed that managers need to understand how the processes within their organisation can be better facilitated through their actions. Valaei and Aziz (2012, p.12) believe that, "the level of knowledge management awareness amongst Iranian firms is medium, in which some companies understand the principles of knowledge management but they observe some obstacles and difficulties in pursuing a knowledge management approach". Valaei and Aziz (2012) argued that there was lack of training, a lack of employee participation, a lack of trust, a lack of rewards for knowledge sharing, as well as an unwillingness to share knowledge among their Iranian case studies.

In addition, empirical work by Akhavan and Jafari (2008) showed that within the Iranian firms CEO support is one of the most important factors that can facilitate and enable the knowledge management elements within the Iranian firms. Another empirical work within the Iranian banking industry showed how top managers'

attitudes in leading their organisations can help companies to achieve organisational innovativeness through knowledge management. Bidmeshgipour *et al.,* (2012, p.481) believe that, "employees, provided with appropriate training and mentoring opportunities to generate novel ideas, would create new services. The mindset of the managers about their human resources absorbs a diversity of opinions and provides equal opportunity for all employees to present ideas".

An empirical work by Arumugam *et al.,* (2011) showed that within Iranian organisations knowledge managers have key roles in initiating processes of organisational change with the managers leading the innovation activities. It is clear that within Iranian firms there is a direct link between managers' mindsets and the employees, and the organisations' knowledge creation activities, and, as Jafari *et al.,* (2007) argued, top managers' support and commitment plays a very important role in knowledge management adoption within Iranian organisations.

3.5.3. Political / Economical Factors and Iranian Knowledge Management

The current economic and political environment of Iran is a source of uncertainty and risk for organisations and the international political situation and economic sanctions have produced instability within the market and organisations (BMI, 2009). These macro environmental factors directly affect organisations' performance and managers' behaviour and affect the motivation of managers, incentives and financial rewards, management behaviour and organisational policies in Iran (Yisa, *et al.,* 2000).

Political factors can be seen as one of the elements that could also affect top management behaviour and the knowledge management process in Iranian organisations. A number of scholars have argued that the government could play a central role in facilitating knowledge management processes. For example, Ferretti and Parmentola (2010,p.175) argued that, the "government and its policies in many

emerging countries such as Iran are directly involved in the relationship with the international joint ventures and knowledge sharing through state-owned companies". As Abdolshah and Abdolshah, (2011) believed, in developing countries such as Iran, the government has the key role in developing knowledge management.

Iranian auto Industry analyst BMI (2009) have argued that how the role of top management within the Iranian automotive industry could be affected by national and international political factors. For example, The Financial Times (March 2012), showed that Peugeot had suspended its knowledge sharing/transfer activities with its local partner IKCO after expansion of the Iranian sanctions by the US government. The Financial Times (March 2012) reported that most of the French experts had left Iran until further notice and as a result of this, the process of knowledge transfer/sharing and knowledge creation between Iran and France, had not yet been completed.

There is also evidence that national political factors could affect knowledge management elements within Iranian organisations. For example, IKCO's former CEO mentioned that how the organisation's long and short term plan in terms of knowledge transfer and technology transfer between IJVs and IKCO could easily have been affected as a result of government changes in Iran (Khabar Online, 2012). Lakshmanan (2013) believes that the recent nuclear deal between Iran and "3+3 Group" (UK, USA, Germany, France, Russia and China) will open a new door for the Iranian auto industry to re-establish its collaboration with European automakers, as the political and economic sanctions against Iran suspended all knowledge and technology transfers from their IJVs. Hatami and Behsan (2012) have argued that Iranian economic and political conditions are considered as significant risks for Iranian managers and organisations.

3.5.4. Role of trust among Iranian organisations

Scholars such as Chiles and McMackin (1996) believed that when the level of trust among organisational members and business partners increases, this also influences and increases the sharing and exchange of information among members and between organisations. However, Parkhe (1993) argued that differences in partners' cultures will negatively influence this knowledge sharing. Al-Abrrow *et al.,* (2013) argued that among their Iranian cases, the concept of trust had a significant impact on organisational performance.

Khanifar *et al.,* (2012, p.2698) conducted their empirical work among 300 employees of an Iranian national company and found that, a "low level of trust caused increasing stress, decreasing efficiency and a lack of creativity, and on the other hand, a high level of the trust caused increasing employee motivation, decreasing absence and increasing creativity of the organisation". In addition, another empirical work by Mahdavi-fard *et al.,* (2013) conducted within an Iranian case study found that organisational culture and organisational trust has impacts on organisational performance.

Mahdavi-fard *et al.,* (2013, p.166) found that, "within the Iranian organisation there is a relationship between organisational culture and its components and organisational trust of the employees. Culture plays an important role in every organisation because it fosters the interaction of individuals inside the organisation. Therefore, trust is under the influence of the main culture of the society (national culture) and the organisational culture". Rezaeian *et al., (*2013) believe that organisational trust has a positive effect on Iranian organisation performance.

3.5.5. Knowledge sharing and acquisition in Iranian organisations

Tohidian and Mosakhani (2010, p.611) argued that, 'Organisational climate in Iran had a positive impact on knowledge sharing and the level of information and

communication technology usage reflected a positive effect on the organisational knowledge sharing". Tohidian and Mosakhani (2010, p.619) found that among their Iranian case studies, "the employees who felt that by sharing their knowledge they would contribute to the achievement of desired outcomes were more likely to share their knowledge. This means that employees' assumptions about their future relationships with other organisational members will improve their attitudes towards knowledge sharing".

In addition, Khohansal *et al.,* (2013, p.293) also found that "there is a significant positive relationship between knowledge sharing and employee performance among their Iranian cases". Tohidian and Mosakhani (2010) believed that since knowledge sharing is a very important behaviour, a successful reward system needs to be encouraging and goal oriented. The rewards systems that workforces do not notice as contingent or performance based might fail to support a knowledge-sharing attitude within the Iranian organisation. Zohoori *et al.,* (2013, p.726) conducted research among Iranian Electronic firms and, "investigated the effects of explicit knowledge sharing and tacit knowledge sharing on the quality and speed of innovation, and the findings indicated that effects are positive and significant". The main contribution of this section was to provide empirical evidence for the role of knowledge management in Iran and among Iranian organisations.

3.6.   The Research Framework

The Research Framework
Research Focus
Knowledge management in the NPD process

Macro Environment:
Political regimes/stability, legal issues (especially intellectual property rights), supply and demand, industry dynamism, technological, institutional framework

Organisational Contexts:
Top management support/management control, organisational structure, organisational culture, information technology, organisational culture, and organisational policies

Knowledge-sharing through knowledge repository in R&D department (explicit knowledge)

Inter-organisational Knowledge acquisition (With international partners)

Knowledge creation process

Knowledge-sharing between R&D department & other departments

Vertical Knowledge-sharing along R&D reporting line

Knowledge-sharing through interaction & socialisation (tacit knowledge)

Figure 9: The research frame work

3.7. Conclusion

This study is a further step towards providing fresh insights into and expanding the body of writing on the NPD process. This literature review brings together a number of the key elements and issues from the knowledge management literature in order to develop a better understanding of the NPD process. Knowledge-transfer, knowledge-creation, and organisational learning within the NPD process have been examined. Knowledge-based theory of the firm and the role of knowledge management and its elements in the new product development process have been reviewed. The role of knowledge-sharing and knowledge-transfer in the new product development process has been explored, and the potential contribution and outcome of the research have been highlighted as being to investigate the new product development process from the knowledge-based perspective, and accordingly to examine knowledge-sharing and the knowledge-transfer processes in the new product development process. It has been argued that new products are consumer and industrial products, offered for the first time. Successful new product development, therefore, at least partially depends on the ability to understand technological and market knowledge, and experience and expertise embodied in existing products and employees' mind, and then adopt this knowledge to support new product development.

The resource-based view argued that firms with valuable, rare and unique resources have the potential to achieve better performance. A firm's resources, at a given time, could be defined as those tangible and intangible assets, such as brand name, in-house knowledge of technology, and the employment of skilled personnel, as well as all assets, capabilities, processes, firm attributes, information and knowledge. The resource-based view explained that a firm's sustainable competitive advantage is reached by virtue of unique resources, and in addition, the knowledge-based view of the firm explored the ways in which firms combined and transformed those valuable, unique input resources to the final performance.

It has been argued that organisational knowledge is an important collection of intangible resources that could be the source of sustainable competitive advantage. The knowledge-based view of the firm argued that knowledge is the most exclusive and unique resource, which allows a firm to combine and coordinate the resources available to all in new ways, thereby providing more value to its customers than its competitors. The literature showed that the knowledge-based view of the firm puts particular emphasis on the interaction amongst individuals, knowledge-sharing and knowledge-creation. Developing a knowledge-based view of the firm raised the issue: what is knowledge?

Knowledge was identified as an organisational asset with uniqueness and originality, and the best way of understanding knowledge better is to identify differences between information, data and knowledge. Knowledge becomes visible when experienced persons put into practice lessons learned over time. In developing an understanding of knowledge within an organisation, a distinction between tacit and explicit knowledge was suggested. Explicit knowledge was identified as knowledge that can be codified and documented and tacit knowledge was identified as knowledge that cannot be articulated or verbalised. Tacit knowledge is embedded in the background and experience of an individual or a group. Tacit knowledge can be understood best as knowledge that has not yet been abstracted from practice; on the other hand, explicit knowledge or codified knowledge is easier to use within an organisation because of its transferability. However, it has been argued that tacit knowledge may offer more sustainable competitive advantage to the organisation.

The main challenge of this thesis is to explore the conversion of tacit knowledge. It is argued that knowledge that is tacit and highly personal has little value until it can be converted into explicit knowledge that other members of the organisation can share. However, such conversion exposes the knowledge to the risk of imitation by other firms and competitors.

Knowledge management covers a series of practices adopted within an organisation to identify, create, represent, distribute and enable the adoption of insights and experience. Such insights and experiences comprise knowledge either embodied in individuals or embedded in organisational processes and practice. Knowledge management has been described as the formalisation of and access to experience, knowledge and expertise that create new capabilities, enable superior performance, and encourage innovation and new product development processes. Knowledge management is making a direct connection between organisations' intellectual assets - explicit (recorded) or tacit (personal know-how) - and the business results. These knowledge management processes can be subdivided into creating knowledge and transferring knowledge - from either outside or within the organisation. In addition, organisational learning has been introduced as a way in which firms build, supplement and organise knowledge and routines around their activities and within their cultures, and adapt and develop organisational efficiency by improving the use of the broad skills of their workforces. It has been argued that the main purpose of transferring knowledge within and between organisations is to learn from other parts. In addition, a number of knowledge management elements that have an impact on learning in the new product development process have been reviewed.

The concept of knowledge-transfer, as one of the key elements of the knowledge-based theory of the firm, was explored; it was argued that the main purpose of transferring knowledge within and between organisations is to learn from other parts of the organisation. Knowledge-transfer has been defined as the transfer of skills, technologies, business practices and data between organisational subunits. The main focus of knowledge-transfer in the thesis was how to transfer tacit knowledge effectively, and four different types of tacit knowledge-transfer were introduced to identify the ways in which organisations transfer their different tacit knowledge. This thesis seeks knowledge-transfer as the communication of knowledge from a source so that it is learned and applied by a recipient.

The last section of the knowledge-based theory of the firm ended with the knowledge-creation concept, which has been identified as the process of making available and amplifying knowledge created by individuals, as well as crystallising and connecting it with an organisation's knowledge system; in other words, what individuals come to know in their work/life benefits their colleagues, organisational knowledge-creation theory explains. The research explored different knowledge creation models, and a number of knowledge-creation facilitators have been introduced.

Another main challenge of this research was to identify the new product development process and accordingly to explore the relationship between the knowledge-based view's elements and the new product development process. Based on this aim, the research has introduced the historical developments of the new product development process. Various NPD models have focused only on internal activities and internal R&D projects, and have ignored communication with outside their departments/organisations, and they have also ignored the use of external knowledge and external resources. Models such as the department stage and activity stage models work in a quite isolated and closed environment and this could be one of the main reasons why they have been named closed models. A lack of feedback from one market or from neighbouring departments or external organisations has been identified. One model directed attention specifically to individual and internal goals. Other models, such as the coupling model, the integrated model, the decision-stage model, and the conversion-process model, directed attention towards the feedback source. They made quite reasonable internal linkages between departments and individuals, internal knowledge-transfer, and the knowledge-creation process between departments and individuals; however, some factors, such as external elements (government policy, regulations) and external R&D (knowledge-transfer from outside organisation), have been ignored during the new product development process. These models consist of members from different functional areas with differing knowledge, which have the advantage of providing multiple sources of

information from within an organisation. However, transferring new knowledge from outside the organisation has no role in such models.

Finally, some other models, such as the response model, cross-functional team and NPD network model, emphasise the external linkages coupled with the internal activities. These models suggest that the new product development process should be viewed as the knowledge-accumulation process, which requires inputs from a wide variety of sources outside the organisation. It has been argued that each new product development process model captures the academic knowledge of the time and summarises perceptions of best practice. Each model generates a useful insight into the nature of the new product development process and decision-making requirement at the level of the firm, pointing to important links between the NPD process and other key processes both within the firm (marketing, manufacturing, management) and external to the firm (e.g. the science and technology environment and external R&D). Lately, researchers have introduced and classified three models of new product development process:

- The linear model
- The coupling model
- The interactive model.

The linear model represents NPD as a sequential and ordered process of four or five stages of activities and decisions. The linear model has been seen as an improved version of the coupling, departmental stage and activity stage models, which include concept development, product design, testing and validation, and product launch. The inputs into the system are new ideas and market needs. Under the linear model, the NPD process can be seen as a series of activities carried out one after another. Sometimes the model makes marketing and market research vital to the NPD process, and sometimes, much like the pure technology push models, it ignores other important aspects of the new product development processes, including the working

relationship with customers, and feedback loops from later or earlier stages. The coupling model is a highly simplified but nevertheless more representative model of the NPD process, and unlike the liner models, it explicitly links the decision-making of firms to the science and technology community and the marketplace. The coupling model is non-linear with feedback loops. Basic knowledge-transfer and internal knowledge-creation have been recognised. Reviewing the NPD process literature clearly identified that it is not necessary to have all knowledge management elements in a single model of the NPD process. For example, knowledge-transfer between departments in linear models is not clearly identified: the department is working in an isolated environment and passing its project to the next department without real communication or a feedback loop from the earlier or later stages. In the linear model, it is difficult to state what is going on at each stage in the different departments. Knowledge-transfer from outside the unit is not recognised. The interactive model is a major improvement on all earlier models, and explicitly and implicitly attempts to address most of the weaknesses outlined previously. Unlike earlier models, feedback loops from different stages are recognised. Environmental factors are recognised in this model. The interactive model mostly has all of the knowledge management elements, as highlighted previously in this thesis. Strong networks between departments and organisations, and effective knowledge-transfer and knowledge-creation between individuals and departments have been identified. Having the interactive model as a guide for this research gives the opportunity to examine and identify the research.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1. Introduction

This chapter explains and justifies the methods used for collecting the data and information in this academic research in order to satisfy the research objectives posed and to answer the research questions. It is an explanation of the research strategy and the multi-stage process that was undertaken in order to answer the research questions and complete this research project. In particular the choice of a qualitative research strategy is discussed and evaluated.

Initially, the broad characteristics of business management research are discussed, and a variety of potential research strategies in the management field are explored in order to present a foundation to explain how the most suitable research strategy was chosen. The choice of a single embedded case study strategy for this research project is explained and justified. The research design, the sampling procedures adopted and the type of data collection employed are then discussed. As part of this discussion, the construction of the interview questions as the main research instrument is also explored. Finally, the chapter concludes with an account of the methodology used to analyse the data collected. Issues relating to the validity, reliability and generalisability of the research are also discussed.

4.2. Research Philosophy

Before starting the research, it is important to justify the philosophical viewpoint and the position of the researcher. Research philosophy is a reflection of a researcher's approach to understanding the world that he or she investigates (Kvale, 1996; Saunders *et al.*, 2003). As such, it is important that the researcher is aware of the philosophical commitments that they make through their choice of research strategy

since this has significant impact not only on what the researcher does but also in understanding what they are going to investigate (Saunders *et al.*, 2003; Johnson & Clark, 2006). It is also necessary for the researcher to be clear as to what is being researched and the manner in which knowledge is gained (Snap & Spencer, 2003).

To begin this process of reflection and justification, the following section first explores the underlying broad research paradigms that are known to exist. The philosophy of each paradigm is set out and discussed before the researcher's choice is established. Adopting a research philosophy means adopting important statements about the ways in which the researcher views the world of their research area. In the following sections, two of the main research philosophies are reviewed before the research philosophy for this thesis is settled and discussed.

4.2.1. Interpretivist

The interpretive approach views the environment not as an objective independent reality but rather as closely bound with the views and perceptions of the individual. Rather than objectivity, the interpretive approach argues that understanding complex human interaction requires interpretation based on the "the subjective states of the people acting in it" (Wellington & Szczerbinski, 2007, p.220). In the interpretive paradigm, the researcher is not assumed to be totally objective; rather, they (their thinking and principles) become part of the research process itself (Rowland, 2005). This seeks to recognise that the researcher is potentially "biased by their own background, knowledge and prejudices to see things in certain ways and not others" (Walsham, 2006, p.321). At heart, as Saunders *et al.*, (2009) have argued, the interpretive approach is very important part of the positivist tradition, considering that the business and management globe is far too complex to lend itself to theorising definite 'laws' in the same way as the physical sciences. Furthermore, the interpretive approach argues that because the world is complex, if such complication was reduced entirely to a series of law-like generalisations, our understanding of reality would be

compromised and uninformed. If a researcher accepts such a view his or her research philosophy is likely to be closer to the interpretive approach. Unlike the positivist stance, physical-law-like generalisations are not the end product; rather, understanding through detailed descriptions is sought by answering questions such as what, why, and how (Walsham, 2006).

Given that the central aim of this thesis is to study and explore knowledge-sharing in NPD processes, an interpretive approach would appear to be more suitable in terms of philosophical stance. This is because, as established in Chapter 3, knowledge is inherently rooted within the experience and expertise of individuals. The transfer of this knowledge between individuals requires the parties to this exchange to establish shared contexts and mental models. In other words, the perception of individuals as to how they relate to the world around them is important to the success of this study. Exploring these beliefs and perceptions would be difficult to achieve using a positivist approach since the subjectivity of the individual is a prime focus. As Saunders *et al.* (2003, p.84) noted, "it is therefore the role of the interpretivist to seek to understand the subjective reality of those that the researchers study in order to be able to make sense of and understand their motives, actions and intentions in a way that is meaningful for the research participants".

Accordingly, this study adopts an interpretive approach in an effort to explore the beliefs and motivations of individuals within the NPD process. It is important to mention that generalisation is not the aim of this study and the researcher is only going to focus on the Iranian Auto industry, specifically IKCO. The researcher should understand complex human interaction from different departments and managerial levels within the case study. In this study the researcher is not totally objective and participants' thinking and opinions become part of the research process. It is clear that the researcher does not have any power over the case study environment and the participants are going to answer the questions freely based on their own background, opinions and will. This study, as a piece of interpretive research, argues that data and

sources are linked with methodologies that highlight and focus on the experiences of the researched group or individual during their work.

4.2.2. Research Approaches: Quantitative and Qualitative

The quantitative study is based on quantitative information, such as numbers and figures, whilst qualitative studies are based on qualitative information, such as words, sentences and narratives. There are scholars who make a distinction between qualitative and quantitative research and others who show a strong preference for one or other type of study (Bryman & Bell, 2007). However, these predilections more likely reflect their own capabilities and experiences than a general idea about which type of research is more useful. As Cooper & Schindler (2008, p.192) noted, "in many social sciences, such as management studies, sociology, psychology, there is no such clear predominance of qualitative or quantitative studies". It should be emphasised that neither qualitative nor quantitative studies are better than the other; essentially, what matters are the research questions under consideration and how they might be answered.

For the purposes of this study, a mixed strategy is adopted that combines both a quantitative and qualitative approach. Given that the researcher is interested in knowledge flows within the NPD process, the context in which such knowledge flows within organisations is important. This means that quantitative information can be helpful in establishing the broad context within which organisations operate. Here, for example, market and organisational characteristics, such as the number of competitors, the size and growth companies, and the profitability of the organisation can be useful. However, by itself, such objective and standardised information is insufficient to allow the researcher to understand the motivations and behaviour of individual actors in the knowledge flow process because quantitative data seeks to iron out contextually sensitive information. As Dabbs (1982, p.32) cautions, "qualitative research refers to the meanings, concepts, definitions, characteristics,

metaphors, symbols and descriptions of things. In contrast, quantitative research refers to counts and measures of things".

For our purposes, qualitative information is flexible and more sensitive to differing contexts in which words, sentences and pictures are used to describe situations (Mason, 2002). Fundamentally, this research attempts to understand social phenomena through differing individual behaviour. In order to achieve this, the qualitative strategy relies on logical inference (Hinton *et al.*, 2003) and is sensitive to the human situation as it involves dialogue with informants (Kvale, 1996). In general, the researcher collects large quantities of detailed evidence, which helps to achieve depth and a detailed insight (Blaxter *et al.*, 1996; Snape & Spencer, 2003; Ticehurst & Veal, 2000). Furthermore, qualitative methods are useful when the researcher is seeking to focus on a dynamic process, such as knowledge flows, as this requires a deeper understanding of behaviour and the meaning and context of complex phenomena (Grunden, 2002; Snape & Spencer, 2003).

Additionally, Saunders *et al.*, (2003) argued that, when researchers explore the data produced by a qualitative study, they are able to draw some major distinctions from those that result from quantitative work. However, this requires attention and ability on the researcher's part, and the ability to make a critical assessment of informants' comments. It involves debating the reasons for adopting a course of action, and challenging and recognising the way in which decisions inform the research (Mason, 2002). The strength of a qualitative approach is that issues can be clarified and justifications for behaviour can be exposed (Gillham, 2008).

In adopting a qualitative approach, the researcher was able to get the inside experiences of individuals to verify how meanings are formed. The main benefit of the qualitative methods used in this research was the employment of open-ended questions, which provided participants with the opportunity to react in their own words rather than pushing and forcing them to decide from fixed and set responses, as

is the case with quantitative methods. Another benefit of using qualitative methods in this thesis was the flexibility that the researcher had to search the initial participant responses to ask why or how. The researcher could then pay attention to what participants said, and could engage with them according to their individual personalities, expertise, experience and styles.

4.3. Research Strategies

Having settled on an interpretive stance and having adopted a combined quantitative and qualitative approach, the next task was to choose an appropriate research strategy. There are a number of research strategies that can be applied in designing and running a research study. In general, a research strategy seeks to cover all phases of design, data collection, analysis and conclusion of the findings. A number of research strategies are in use in the management field including: experiments, surveys, histories, analyses of archival information and case studies. Yin (1994, p.1) argues that, "each of these strategies has its own advantages and disadvantages, depending on three conditions:

1) The form of research questions posed;
2) The extent of control a research has over actual behaviour;
3) The degree of focus on contemporary as opposed to historical phenomena".

4.3.1. Alternative Research Strategies

A research strategy is concerned with the high-level framework used to address the research questions (Saunders *et al.*, 2009), and serves as a basis for confirming the validity of findings. Yin (1994) has categorised the five most commonly used research strategies, as set out in Table 35.

Table 35: Relevant situations for different research strategies

Research strategy	Form of research questions	Control over behavioral events	Focuses on contemporary events
Experiments	What , how , why	Yes	Yes
Surveys	What, who, where, how many , how much	No	Yes
Archival analysis	What, who, where, how many, how much	No	Yes / No
Histories	What , how , why	No	No
Case studies	What, how , why	No	Yes

(Yin, 1994, p.6)

A basic form for research questions is: who, what, where, how or why. If a research question adopts a 'what' type of question, two possibilities are achievable. First, the 'what' question could be exploratory; for example, what are the ways in which an IJV company operates? Exploratory questions like this can be used within any of the research strategies. The second 'what' question could be in terms of how many or how much; for example; what has been the result of investment on the marketing budget? The results of these kinds of question usually come from survey or archive analysis because they tend to be seeking closed rather than open-ended answers. In the same way, 'who' and 'where' questions are likely to favour a survey or archival analysis strategy. If a research study asks 'how' or 'why' types of questions - which are more explanatory in nature - then the use of experiments, histories or case studies are more appropriate. As Yin (1994, p.6) argued, "this is because such questions deal with operational links needing to be traced over time, rather than more frequencies or incidence".

In an experimental method, a researcher can control behaviour directly; this can either happen in a laboratory where an experiment may focus on one or two variables, or it can be achieved in field research where the researcher treats the subjects being investigated. Survey and archival analysis methods do not require any control over behavioural results. Histories focus on the past, and the investigator has no control

over or access to any behavioural events; instead, the focus is placed on documents, cultural and physical materials as the main sources of evidence. Similarly, the case study does not manipulate the behavioural elements being studied.

Yin (2003) stresses that it is important to emphasise that no research strategy can be called better or poorer than any other. Much more fundamental is the selection of the most appropriate strategy, which would enable the researcher to answer his or her particular research questions and meet his or her objectives. It should be remembered that research strategies should not be thought of as being mutually exclusive: it is possible to employ the survey strategy as part of a case study (Saunders *et al.*, 2009).

Based on Yin's categorisation in Table 10, this research will utilise the *what, how and why* type of questions. In addition and referring to Table 10 only experiments, histories or the case study strategy is suitable for this research since the researcher has no control over the behavioural events being investigated. Moreover, in exploring knowledge flows, this research examines not only the role played by individuals but also the surrounding personal context, perceptions and motivations. This research is based on a case study approach; it is important to identify the research design as well. Yin (1994, p.2) argued that, "a research design can be seen as a technical plan that attempts to link the beginning and the ending of a study. The research design role is to ensure that the evidence to be collected is pertinent to the study". The research design is similar to an instruction that helps the researcher during his/her data collection and analysis to understand those data. At the end, he or she will come to their conclusion, and there will be the possibility of generating a theory or developing the current theories.

Eisenhardt (1989) argued that case studies can be used to offer an explanation, to investigate theory or to create theory. In this case study, there is the potential for all three of the possibilities mentioned. In this single case study, most of Eisenhardt's (1989) suggestions were followed. Steps such as the usage of qualitative and

quantitative data, the definition of research questions, focusing on a specific population, applying multiple data collection methods, and finally analysing data and comparison with the literature review were all applied. It is important to mention that the use of several investigators is not recommended for this single case study as it is believed that it should be carried out and undertaken individually. The data collection method is the next step after identifying the research strategy. It is important to establish how the researcher gathered his data from his case study. Thus, in the following section, the methods applied by the researcher to gather the data during the research will be discussed.

4.3.2. Case Study

Yin (2003, p.13) defined a case study as, "an empirical inquiry that investigates a contemporary phenomenon within its real life context, when the gap between the phenomenon and the context are not clearly obvious, and in which multiple sources of evidence are used". The intention here is that the case study is appropriate to probing type questions (what, how and why) in an effort to uncover the underlying processes at work. Since the focus is on understanding the phenomenon, multiple methods of data collection can be deployed. This is a strong advantage of the case study because the multiple methods of data collection enable the researcher to examine closely, in substantial detail, the phenomenon under focus (Gallier, 1992). Consequently, and as a result, no single method of data collection is associated with the case study approach (Gerring, 2007).

The case study typically requires deep focus on the object being studied; this requires the researcher to accept the role of observer (Gerring, 2007). Typically, the case study is rooted within a naturally occurring, often contemporary, situation (Benbasat *et al.*, 1987). This makes the case study particularly suited to research that is exploratory in nature (Whelan & McGrath, 2001). The case study approach can also be deployed in explanatory or descriptive research (Cooper & Schindler, 2008).

The case study methodology is versatile in that it can be applied to a wide variety of contexts. Gillham (2008), for instance, argued that a case study can be on an individual or a group (such as a family, a class, an office or a hospital area) or it can include an association (for example, a school, children's home or a factory). It can equally be on a major community, a town or an industry. The case study method is thus not restrictive and can either be applied as a single case or can incorporate multiple cases such as a number of single parents, several schools or two different professions.

A case study can be used to validate existing theories whereby the researcher develops a theoretical conjecture from the evidence collected (Remenyi *et al.*, 1998). However, the case study approach is also appropriate in conditions where a single explanation cannot present a full view of the research topic. It is appropriate to achieve an in-depth, holistic knowledge of broad, complex phenomena, and an understanding of interactive processes, relationships, political issues and influence tactics within specific contexts. Therefore, it offers greater depth of enquiry than other methods. Considering the focus of this thesis, the ability to intensively probe and investigate organisational processes and individual behaviour in a modern setting using a variety of data sources suggests that the case study approach is an appropriate choice for this research. Nonetheless, a major criticism of the case study approach is the problem of generalisability which is to be addressed later in this chapter.

4.3.3. Embedded Case Study

Yin (2003) argued that an embedded case study is a case study containing more than one sub-unit of analysis. Similar to a case study, an embedded case study methodology provides a means of integrating quantitative and qualitative techniques into a single research study. Moreover, the recognition of sub-units allows for a more detailed level of inquiry. The embedded case study is an empirical form of inquiry appropriate for descriptive studies, where the goal is to analyse the features, context,

and processes of an event (Scholz & Tietje, 2002; Yin, 2003). The chosen case study is the Iran Khodro Company (IKCO); this is the most important car manufacturer in Iran, the Middle East and North Africa, and currently (in 2011) employs over 53,000 workers and holds over 50% of the local car market in Iran. IKCO is of interest because it acts as one of the main sites for Peugeot in the region, and exports passenger and commercial vehicles to over 30 different countries. IKCO plays a very important role in the country's economy, and also influences other domestic industries. Government reports show that nearly a half a million people have a business relationship directly with IKCO in Iran. IKCO is one of the best cases to explore the research questions because the company jointly (IJVs, Peugeot) and independently produces a number of different brands of automotives. This characteristic of Iran Khodro (IKCO) provides opportunities to investigate the NPD process (within IKCO) in contrasting settings. Furthermore, IKCO's NPD process has not been explored previously in the literature, and so this gives an opportunity to provide fresh insights into knowledge-transfer/storage in the NPD process, especially within the Iranian context.

4.4. Evaluation of the Research

The main reason for setting up a good research design is to present the best possible logic that can make a connection between the collected data, questions and findings. It is the researcher's responsibility to judge the quality of design on the basis of standard logical tests that are used in academic research in the business and management fields. Kidder (1981), cited in Yin (1994, pp.40–41), introduced four possible logical tests as follows:

- "Construct validity: establishing correct operational measures for the concepts being studied.
- Internal validity: establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships.

- External validity (or generalisability): establishing the domain to which a study's findings can be generalised.

- Reliability: demonstrating that the operations of a study – such as the data collection procedures can be repeated, with the same results".

Table 36 shows the four tests and case study methods for dealing with them.

Table 36: Tests of validity, generalisability and reliability

Test	Case-study tactics	Phase of research
Construct validity	• Use multiple sources of evidence • Have key informants review draft case study report	• Data collection • Composition
Internal validity	• Do pattern matching • Do explaining building	• Data analysis • Data analysis
Generalisability	• Use replication logic, as opposed to statistical logic, in multiple case studies	• Research design
Reliability	• Use case study protocol • Develop case study data base	• Data collection • Data collection

(Yin, 1994, p.33)

The methods of evaluating the validity, reliability and generalisability of positivist research are regarded as being of relatively little significance by many qualitative researchers for judging the qualities of their interpretive investigations (Mason, 2002).

4.4.1. Generalisability

Generalisability is concerned with how the findings generated in one setting can be applied to other settings (Yin, 2003). The extent to which case studies can be considered generalisable or not depends upon the number of case studies undertaken (Easterby-Smith *et al.*, 1991). This is because a single case study can be subject to "several potential biases, such as the misjudgement of the representativeness of a single event, exaggeration of the salience of a datum because of its ready availability,

or biasing of estimates because of unconscious anchoring and multiple cases augment external validity and help guard against observer biases" (Leonard-Barton, 1990, p.250). However, statistical generalisability to a broad population is not necessarily the objective in qualitative research; rather, the main focus is directed towards ensuring appropriate demonstration of the study's events as well as understanding the key issues under investigation. In such situations, Saunders *et al.*, (2009) noted that the purpose of the research would not be to produce a theory that is generalisable to all populations, but more modestly to a particular context. They went on to argue that, "in short, as long as a researcher does not claim that their results, conclusions or theories can be generalised, then there is no problem" (Saunders *et al.*, 2009, p.158). This research is set within a single company, and is specific to this context. As such the researcher recognises the limits of extending the findings from this study into a broader context. However, where situations can be identified as being identical in context, the findings from this study can also be extended (Sekaran & Bougie, 2010).

Consequently, in this research there is no expectation of generalisability resulting from the single case study (embedded-case study). The aim of this research is to understand the knowledge flows occurring within Iran Khodro (IKCO). The results of the study are, at best, generalisable only to other situations and settings sharing the same context as the case study; these are most likely to be other domestic car companies operating within the Iranian auto industry. There are only a limited number of automakers (25 auto makers) in Iran, and IKCO is known as the most important auto maker not only in Iran but also in the Middle-East, Central Asia and North Africa (to be discussed in Chapter Four).

4.4.2. Validity

Validity is a test of "how well an instrument that is developed measures the particular concept it is intended to measure. In other words, validity is concerned with whether we measure the right concept" (Sekaran & Bougie, 2010, p.157). From an

interpretivist perspective, validity refers to how well the research method investigates what it intends to (Mason, 2002), as well as the degree to which the researcher gained full access to informants knowledge and meanings (Remenyi *et al.*, 1998). Validity is concerned with whether or not the findings are really about what they appear to be about (Saunders *et al.*, 2009). The vital issue in qualitative research is achieving an equivalent of understanding between the informant and the researcher (Lewis & Ritchie, 2003), as well as ensuring that the research is reliable. This involves demonstrating that the research design accurately identifies and describes the phenomenon under investigation. A number of authors have suggested strategies to enhance the validity of qualitative studies. For example, Mason (2002) discussed the need to demonstrate the validity of data generation and the validity of the researcher's explanations. Validity of data generation is concerned with how appropriate and suitable a specific research method is in terms of answering the research questions and providing explanations. On the other hand, Lewis & Ritchie (2003) suggested that it is also useful to consider the qualitative study's internal and external validity. Internal validation is improved by adopting a constant comparative method and recognising the importance of unexpected cases when acquiring a greater understanding of theory development.

This study*,* as mentioned earlier, utilises multiple sources of data collection including interview and documentary sources. The case study technique was used to validate existing theories whereby the researcher develops a theoretical assumption from the evidence collected (Remenyi *et al.*, 1998). As discussed, the case study method is considered appropriate in situations where a single explanation cannot provide a complete view of the research topic. It is also suitable for researching in-depth, complex phenomena and understanding relationships, political issues and influence tactics within specific contexts. With reflection of validity in mind, this study adopted the use of semi-structured interviews to collect detailed descriptions and multiple informant views to be gathered on a reasonably consistent basis. Validity of interpretation is also concerned with how believable the data analysis process and the

researcher's interpretations are; this is dependent on the validity of the research method especially the approaches taken in data analysis and the transparency of the researcher's interpretation.

It was impossible for the researcher to collect and analyse all of the data available to him as a result of time, money and access restrictions. Choosing the most appropriate case from a number of available cases helped to reduce the amount of data needed by considering only data from a subgroup rather than all possible cases or elements. A sample group of employees and managers was therefore chosen for interview (Saunders *et al.*, 2009). Care was taken to ensure that the sample chosen was representative of the organisation. However, there was still the risk that relying too much on just a few key informants could pose problems in terms of the validity of the study if the candidates/interviewees presented a prejudiced picture of the case issues. To mitigate this risk, candidates were selected from different departments and from different managerial levels with a broad range of work experience. In addition, the semi structured interview style adopted enabled the researcher to explore in-depth specific areas of interest. Data triangulation with company documents was also used to evaluate the validity of the interviewees' responses. In this study, the validity of interpretation was improved by taking considerable care in understanding the issues that were of concern to the informants, such as by focusing on the evidence supplied by them and by reflecting on the issues raised. Interpretation and arguments were supported by direct quotation from informants or reference to other evidence sources. The interview questions in this study were designed based on three sources:

- Previous scholars' research questions
- Previous scholars' research measurements
- Reviewing the literature and applying the definitions to the interview questions.

The concepts explored and discussed in the literature review were used to help inform the interview questions in this study. These concepts were drawn from the various

fields of knowledge-creation, knowledge-transfer, and prior knowledge, absorptive capacity and the NPD process. The interview questions were pre-tested in English and in Persian in the UK and Iran before conducting the field study. These tests helped the researcher to assess the validity of the questions.

4.4.3. Reliability

Bryman & Bell (2007) defined reliability as being concerned with the question of whether or not the results of the study are repeated easily. The term is commonly used in relation to the question of whether or not the measures that are devised for concepts in business and management, such as team-working, employee motivation and organisational effectiveness, are reliable. In addition, Kvale (1996), Mason (2002) and Yin (2003) also argued that reliability mostly concerns whether or not a piece of research is going to be repeatable in the future. Strauss & Corbin (1990) also argued that, in the context of qualitative research, it is difficult to reproduce results that have already been achieved at two different times and in two different situations. Strauss & Corbin (1990) believed that the circumstances and the environment of the case study where the evidence is gathered are not steady and that the same candidates in the same study but at different times and in different situations and circumstances in the future may not give similar answers to a similar question or to similar questions. The participants may improve their knowledge surrounding the key issues, and next time they may answer differently. Other authors, such as Lewis & Ritchie (2003), argued that a researcher is able to improve the reliability of his or her research, and that this can be reached by testing his/her understanding and through continuous field work, making sure that all candidates/participants have an adequate chance to talk about their knowledge and skills, and afterwards methodically analysing the data and providing supporting explanation of the evidence before finally providing a balanced viewpoint.

In this study, the above requirements were addressed and the data collected. All of the research decisions have been recorded, giving the opportunity for transparency and allowing the research to be traced from the beginning to the end. Bryman & Bell (2007) agreed that reliability and validity are two important criteria when establishing and assessing the quality of research for quantitative research. However, there has been much debate about qualitative research. The issue of measurement validity for example, almost by definition seems to carry connotations of measurement; since measurement is not a major preoccupation among qualitative researchers, the issue of validity would seem to have little bearing on such studies. Saunders *et al.*, (2003) pointed out that reducing the possibility of getting the answer wrong means that attention has to be directed to two particular emphases on research design: reliability and validity. Reliability can be assessed by posing the following three questions:

1. Will the measures yield the same results on other occasions?
2. Will similar observations be reached by other observers?
3. Is there transparency in how sense was made from the raw data?

4.5. Sampling Procedures

Sampling is used as it is rarely possible or practical to collect data from the entire population of interest. As Saunders *et al.*, (2009) argued, a series of restrictions on the researcher, such as time, fiscal resources or access, forces consideration of some form of population sampling. Sekaran & Bougie (2010) went further and contended that, in some cases particularly involving multiple elements sampling could be seen as superior to assessing the whole population. In such cases, sampling has the advantage of avoiding unforced errors as a result of research fatigue. In terms of the present study, IKCO is the largest automaker out of 25 companies operating in the Iranian auto market. IKCO holds over 50% of the market in terms of value and units and based on the reports and figures (as will be illustrated in Chapter Four); there are a number of mutual issues among the Iranian automakers. This suggested that IKCO was the most likely candidate in terms of representation, for sampling in this study.

However, IKCO alone was too large (53,000 employees) to explore thoroughly on the grounds of practicality, cost and time. Therefore, it was decided to use sampling to select the most appropriate sub groups to study within IKCO given the research focus (Sekaran & Bougie, 2010). Generally, sampling techniques available to researchers can be divided into two types: probabilistic and non-probabilistic. Table 37 categorises the sampling methods into two main areas.

Table 37: Sampling techniques

	Sampling	
Probability		**Non-probability**
Simple random		Quota
Systematic		Snowball
Stratified random		Convenience
Cluster		Self-selection
Multi stage		**Purposive** Extreme case Homogeneous Heterogeneous Critical case Typical case

(Saunders, *et al*., 2009, p.213)

From the array of possible sampling techniques illustrated in Table 37, this study chose to use purposive sampling. This allowed for the targeting within the case company of specific groups of individuals relevant to exploring the research questions. The sampling was restricted to specific types of people who could offer information, either because they were the only ones who had the knowledge or because they met the criteria set by the researcher. Purposive sampling technique can be divided into two main categories as follows:

A: Judgment sampling   OR   B: Quota sampling

In judgment sampling, those who have the best position to provide information are required. If, for example, our question is centred on investigating a finance matter in the finance department and women workers within an organisation, then first-hand

information could be given by women related to the finance department; however, this type of sampling calls for special effort to locate and gain access to the individuals with the necessary information. As a limitation, this sampling design is useful only for answering a particular type of research question (Sekaran & Bougie, 2010). In contrast to quota sampling, the researcher seeks to ensure a more consistent representation across the organisation. Consequently, sampling quotas are constructed of sub groups that are weighted in proportion to their overall volume within the organisation (Sekaran & Bougie, 2010). Table 38 categorises the description, advantages and disadvantages of the two sampling methods.

Table 38: Sampling Designs

Sampling Designs	Description	Advantages	Disadvantages
Judgment	Subjects selected on the basis of their expertise in the subject investigated	Sometimes, the only meaningful way to investigate	Generalisability is questionable; not generalisable to entire population
Quota	Subjects are conveniently chosen from targeted groups according to some predetermined number of quota.	Very useful where minority participation in a study is critical	Not easily generalisable

(Sekaran & Bougie, 2010, p.280)

The following organisational charts and the following two tables provide a clear view of the case study. This organisational chart clearly identifies each department's members.

4.5.1. IKCO's Organisational Structure and Key Players

Figure 10: IKCO's organisational chart

Passenger car production line

January 2011

Directorate

Level 1

Chief Executive (CEO) → Administration

Level 2

2.1: Vice-Human Recourse

2.2: Vice-Products & Quality

2.3: Vice-Production

2.4: Vice-Finance

2.5: Deputy of international export

2.6: Cast iron administration

Deputy of:

3.1: Structure & system
3.2: Strategy & planning
3.3: Human recourse
3.4: Legal action
3.5: Inspection
3.6: Marketing & Trade
3.7: Customer relationship manager

Level 3

Deputy of:

3.1: Design and NPD
3.2: Production process
3.3: Quality
3.4: Representative of CE in the passenger line
3.5: Engineers' department

Level 3

Deputy of:

3.1: General production system
3.2: Passenger vehicle
3.3: Engine
3.4: Renault L90
3.5: Vehicles' parts

Level 3

Deputy of finance:
3.1: Accountancy of sale & service
3.2: Accountancy of managers
3.3: Accountancy of industry
3.4: Accountancy of financial activities
3.5: Accountancy of internal activities
3.6: Accountancy of stockholders
3.7: Accountancy of expenses
3.8: Purse & investment
3.9: Controlling of IKCO's direct owned Co
3.10: Research and evaluation
3.11: Financial & business activities
Deputy of Trade (Purchase)
3.12: Accountancy of domestic purchases
3.13: Accountancy of international purchases

Level 3

2-1. (3.3) Deputy of Human Recourse

Level 3

4.1: Administration of: Education & development

Level 4

4.2: Administration of: Training & support (Employees)

Level 4

4.3: Administration of: Future planning & human capital

Level 5

Level 5

Level 5

5.1: University relationship & Knowledge Development

5.2: Manager Support education & training

5.3: Educational Programme for employees

5:4: Planning & evaluating of all programmes

5.5: Administration Education Programme

6.1: Human capital expert (BA)
6.2: Finance expert (BA)
6.3: Business expert (BA)
6.4: Mechanic engineering expert (BA)
6.5: Electronic & computer engineering expert (BSc)
6.6: Polymer, chemistry, paint & environmental expert (BSc)
6.7: Industrial engineering expert (BSc)

Level 6

2.2. (3.1) Deputy of Design & NPD

Level 3

Level 4

4.1

4.2

4.3

4.4

4.5

4.6

4.7

4.8

4.9

Administration of:
Designing of
collaborative system

Administration of:
System & Quality

Administration of:
Technical support

Administration of:
Development of Samand platform A/B

Administration of:
Development of Samand platform C/D

Administration of:
Development of Renault L90 platform

Administration of:
Development of Peugeot 405 platform

Administration of:
Quality design

Administration of:
Development of Peugeot 206 platform

The following two tables (39 and 40) clearly show the number of employees in IKCO's passenger car section and the R&D centre.

Table 39: IKCO's Passenger production line employees (Feb 2011)

	Full-time employees	Contract employees
1-Secondary School Degree	1,565	137
2-High School Degree	13,467	773
3-College Degree (2years College)	2,744	20
4-BSc & BA	2,568	57
5-MSc & MA	616	4
6-PHD	57	0
7- BSc / BA students	12	0
8- MSc / MA students	41	0
9-PhD students	3	0
Total number of employees	21,073	991

(IKCO's internal HR report, 2011)

Table 40: The number of employees in the R&D at IKCO

Degree	IKCO (employees)	Contract (Employees)
1-Secondary School Degree	25	2
2-High School Degree	82	0
3-College Degree (2years College)	84	0
4-BSc & BA	225	0
5-MSc & MA	115	1
6-PHD	5	0
7- BSc / MA students	0	0
8- MSc / MA students	0	0
9-PhD students	2	0
Total number of employees	538	3

(IKCO's internal HR report, 2011)

A group of participants were identified to be interviewed. Referring to Table 41 (following page), these participants were drawn from their relation to the NPD process in IKCO. Candidates were selected according to the following criteria:

1. He / She must be involved in the NPD process
2. He / She must have work experience of more than 2 years in IKCO
3. He / She must have 1-year work experience in his/her current position.

In addition, three products (vehicle brands) within the IKCO's portfolio of products were targeted and the chosen candidates based on the above-mentioned criteria had to be active in the following production projects:

- Peugeot SD (a joint venture developed brand between IKCO and Peugeot) which could give more opportunities to find out about the process of knowledge-transfer/sharing between IJV and the domestic partner within the process of new product development in the IKCO.
- Samand (a totally domestic developed brand that is being improved)
- Peugeot Pars (a totally domestic developed brand not showing improvement)

Table 41 details the list of participants for the first visit interview as a first draft. However, this list was changed after agreement between the researcher and IKCO. The final list for the first visit can be seen in Table 42.

Table 41: List of participants for first interview (first draft)

Positions	These Staff has interviewed in	Number
Vice-president Level (3)	1. Human Resource 2. Product & Quality 3. Production 4. Marketing	4 Staff
Head of department Level (4)	1. Marketing & Trade 2. Customer relationship 3. Design & NPD 4. Quality 5. Engineers' department 6. Peugeot SD 7. Peugeot Pars 8. Samand	8 Staff
Managing Officer Level (5)	1. Education & Development 2. Training & Support 3. Future Planning and HR capital 4. Technical Support 5. Design & NPD 6. Development of SD 7. Development of Samand 8. Development of Pars 9. Quality design 10. Marketing & Trade	10 Staff
Administrators Engineers Technicians Level (6)	1. Admin : University Relationship & Knowledge development 2. Senior engineer technical support 3. Senior engineer design & NPD 4. Senior engineer development Samand 5. Senior engineer development SD 6. Senior engineer development Pars 7. Senior technicians SD 8. Senior technicians Samand 9. Senior technicians Pars 10. Admin Marketing & Trade	10 Staff
Coordinators and workers Level (7)	1. Coordinators SD 2. Coordinators Samand 3. Coordinators Pars 4. Senior Workers SD 5. Senior Workers Samand 6. Senior Workers Pars 7. Marketing & Trade	7 Staff
Total number		39 Staff

After several negotiations between the researcher and the organisation, the following people (Table 42) were chosen to be interviewed during the first visit in June 2010.

Table 42: The final list of participants for the first visit (IKCO/June 2010)

Transcript No	Candidate No	Candidates' job	
01A	1	Deputy Director of NPD Department	NPD Department
02A	2	Prototyping Manager	
03A	3	Planning & Integration Class C/D Manager	
04A	4	Internal Accessories Mechanism Manager	
05A	5	Design & Development of Engine Manager	
06A	6	Adaption of Engine & Power Transmission Manager	
07A	7	Planning & Integration Class A/B Manager	
08A	8	Platform X90 Manager	
09A	9	Deputy Director of Strategy Department	Strategy Department
10A	10	Relationship Between Peugeot France Senior Advisor	
11A	11	Relationship Between Peugeot France Manager	
12A	12	Technology Strategy Manager	
13A	13	Planning & Control Senior Advisor	
14A	14	Planning & Future Strategy Senior Advisor	
15A	15	Market Strategy Manager	
16A	16	Market Planning Senior Advisor	
17A	17	Deputy Director of Marketing Department	
18A	18	Deputy Director of Quality Control Department	
19A	19	Deputy Director of HR	HR
20A	20	Research and Entrepreneurship Manager	
21A	21	Scientific Group of HR manager	
22A	22	IT Facilities Senior Advisor	

Class A/B: (206, SD, Roa, and Pick-up)   Class C/D: (L90, Samand, Pars, 405)

Appendix 15 shows more details relating to participants' background.

4.5.2. The Follow-up Interviews

Following on from the first set of interviews and based on the reflection and analysis of the data gathered a second set of participants was chosen for a second round of

interviews. This second set of participants included some of the participants from the first visit and a number of newly identified candidates. In some cases, follow-up interviews with particular participants in the first round were not possible because of subsequent organisational changes and varying access limitations. The list of second round participants is shown in Table 43.

Table 43: The final list of participants in the follow-up interviews

Transcript No	Candidate No	Candidates' job	
23B	1	Deputy Director of NPD Department	NPD Department
24B	2	Prototyping Manager	
25B	3	Planning & Integration Class C/D Manager	
26B	8	Platform X90 Manager	
27B	5	Design & Development of Engine Manager	
28B	6	Adaption of Engine & Power Transmission Manager	
29B	7	Planning & Integration Class A/B Manager	
30B	9	Deputy Director of Strategy Department	Strategy Department
31B	10	Relationship Between Peugeot France Senior Advisor	
32B	11	Relationship Between Peugeot France Manager	
33B	15	Market Strategy Manager	
34B	12	Technology Strategy Manager	
35B	23	Material Research Centre Manager SAPCO	
36B	24	Deputy Director of Test & Auto Research SAPCO	
37B	25	The independent interviewee. A key informant of the PAD	
38B	25	who led the joint venture project with IKCO	

4.5.3. Back-up Plan for the Follow-up Interview

It was felt necessary to have a back-up plan because of the limitations in terms of access and time. Accordingly, it was decided that, if the fieldwork was to encounter unexpected delays, then the following plan would be applied by the researcher, as shown in Figure 11.

Figure 11: Follow-up interview

- First choice: Peugeot SD which could give more opportunities to find out about the processes of KT / KC between IJVs
- Second choice: SAMAND which could give more opportunities to find out about the process of KT/KC from IJV to a local brand
- Third choice: Peugeot Persia (PARS) which could give more opportunities to find out about an IJV project that had not improved

4.6.   Data Collection

4.6.1. Alternative Data Collection Methods

Figure 12 illustrates a number of different methods available for collecting data in social research. Data from a number of different sources is considered helpful in terms of triangulating findings; this helps to inform the validity of the research. The benefit of using multiple methods to gather data within a case study was mentioned by Benbasat *et al*., (1987, p.374) "using multiple methods of data collection offers the opportunity for triangulation and lends greater support to the researcher's conclusions".
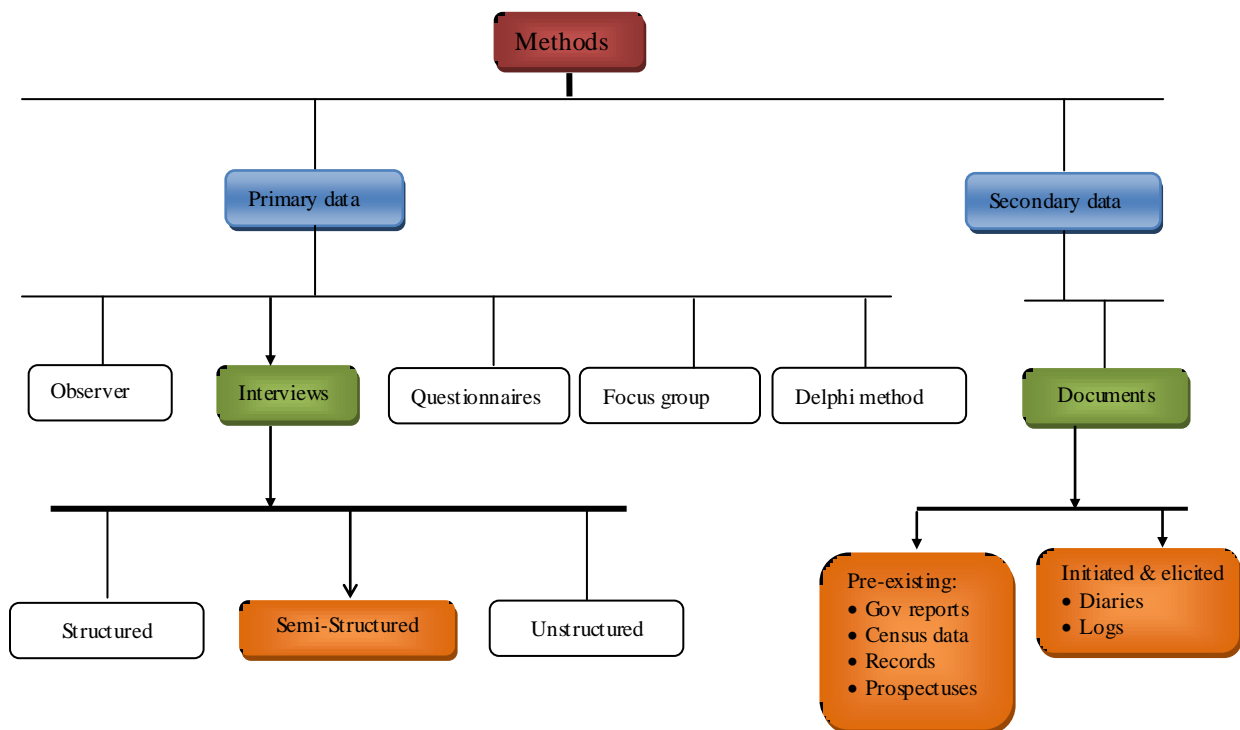

Figure 12: A way of Classifying Methods in Social Research
Wellington & Szczerbinski (2007, p.79)

In this research, the researcher decided to apply interviews and document sources as the main data collection methods. The document data in this research were collected from six sources (the organisation's website, newspaper articles, independent reports, international reports and semi-structured interviews). Data collection via semi-structured interviews involved developing multiple interview schedules; identifying knowledgeable informants; conducting pilot interviews and schedule refinement; carrying out the remaining interviews; and transcribing and translating the interview materials.

4.6.2. Primary Data (Interview)

The interview has been conceptualised in several different ways. For example, Rubin & Rubin (1995) and Johnson (2001) suggested that the interview is a conversational partnership, whilst Mason (2002) classified it as a type of social interaction. Moreover, Kvale (1996) argued that interviews are an interchange of views between two persons conversing about a mutual interest. For our purposes, Czarniawska (2004, p.47) succinctly defined the interview "as two people seeking knowledge and understanding in a common conversational endeavour". In this sense, an interview is a purposeful discussion between two or more people (Kahn & Cannel, 1957. cited in Saunders *et al.*, 2009, p.320). The popularity of the interview as a research tool is linked to its ability to achieve a range of informative views and to communicate multiple perspectives on a perceived fact (Johnson, 2001). This assists the researcher in capturing accounts of events from individuals who have often participated in those events (Walsham, 1995; Spender, 1989). As Kvale (1996, p.1) notes, "the interview helps to understand the world from the subject's point of view, to unfold the meaning of people's experiences, to uncover their world prior to scientific explanations". The interview provides an undiluted focus on the informant and offers an opportunity for clarification and greater understanding through the use of follow-up questions (Legard *et al.*, 2003; Ritchie, 2003).

In this study, the main tool for collecting data was conducting interviews, which could help the researcher to gather valid data relevant to the research questions and objectives. The interview was also selected as it offered the advantage of versatility particularly in terms of allowing opportunities to pose new questions that followed up on interviewees' replies (Bryman & Bell, 2007).

Interviews can be seen either as formalised or structured, using standardised questions for each research participant, or they may be informal and unstructured conversations. Interviews may be categorised into the following three groups:

1- Structured interviews
2- Semi-structured interviews
3- Unstructured interviews.

This research adopted semi-structured interviews to combine both structure and flexibility (Legard, *et al.*, 2003). Appendix 15 gives more information about the participants' backgrounds.

4.6.3. Secondary Data

Saunders *et al.*, (2009) believe that re-analysing data that have already been collected for other reasons can present supplementary insights with which to answer the research questions. Most organisations keep and store different types of data and information to support their operations. This stored data can help researchers to better establish the organisation's environment and business activities process. Secondary data also provides a strong role in triangulating results and findings. Secondary data is particularly useful in helpful to establish the background of an organisational context. In this study a number of secondary data sources were used to support the empirical analysis; these secondary data sources included the organisation's reports, figures, government documents, national reports, international reports, and domestic

and international newspaper reports. Kontio (2004) argued that supporting documentation is also highly valuable when corroborating evidence collected in semi-structured interviews.

4.6.4. Semi-structured Interviews

The researcher schedules interviews with people who have relevant information and knowledge on the issues. The questions have a particular structure, such as open questions. In semi-structured interviews, the researcher wants to know the informant's viewpoint on the matter; on the other hand, the researcher also wants to know whether or not the informant can confirm insights and information already held by the researcher. Semi-structured interviews require a knowledgeable interviewer who is able to challenge and delve deeper into the minds of the interviewees without starting an argument and ruining the supportive atmosphere of the interview (Cooper & Schindler, 2008).

Saunders *et al*., (2009) argued that, in semi-structured interviews, the researcher prepares a number of research questions and research themes that are going to be questioned and answered. However, Saunders *et al*., (2009) argued that these questions may differ from one interview to another or from one department to another. In this situation, the researcher may omit a number of questions in specific interviews or departments. Also, there is the possibility of changing the order of questions when the interviews and conversations flow. During a semi-structured interview, additional questions may be needed. It is worth mentioning that the conversations are recorded using audio recording equipment and notes are taken by the researcher.

A semi-structured interview was applied in this study where the researcher interviewed IKCO's knowledgeable staff. Key research questions, such as questions about the role of prior knowledge, absorptive capacity, and knowledge-transfer in the

NPD process, were investigated across the case study site. During the course of these semi-structured interviewees, the researcher achieved detailed answers. The researcher had a list of questions to be covered; some questions varied from interview to interview. This means that the researcher omitted some questions in particular interviews, given the specific organisational context that is met in relation to the research. The order of the questions was also varied depending on the flow of the conversation. On the other hand, additional questions and open-ended questions were required to explore the specific responses from individuals during the interview. As a result, the questions were not asked exactly as outlined in the schedule. Questions that were not included in the guide were asked as the interviewer picked up on responses from the interviewees; all of the questions were asked using a similar wording for all of the interviewees, as Bryman & Bell (2007) suggested. The following steps were implemented during the study:

- Clarifying the study's purpose and the research questions
- Designing and planning the methods
- Designing the research criteria
- Choosing the interviewees based on the research criteria
- Conducting interviews with the interview guide
- Recording the interviews / taking notes
- Transcribing the recorded interviews
- Translating the transcripts
- Analysing interview material
- Verifying research findings
- Reporting and communicating findings in a written medium.

4.6.5. The Study Challenges

4.6.5.1. Permissions

In this study, the researcher had to negotiate access permission from the organisation on several different occasions. The main cause of this issue (having to seek permission on four separate occasions) was a number of factors including major organisational change within the senior managerial levels, changes in the organisational chart, and changes in the organisation's interests during 2009 -2010. However, it is worth mentioning that all permissions were documented on official papers. Unfortunately, however, the lengthy and disruptive negotiations to secure and maintain access affected and ultimately postponed the research processes for almost 18 months. As already highlighted in the literature review, political factors affectively influenced the managerial and organisational behaviour after Iranian presidential election in 2009 and this political activity caused some changes in different managerial levels within the IKCO. To tackle the above mentioned challenges, the researcher had to go back to Iran and attend several meetings with new organisational (IKCO) members from the Data Protection Department, the Strategy Department, The Education and Training Department. In these meetings the processes of the research, the benefit of the research for the company / industry, the number of interviewees and also ethical matters needed to be clarified again with the new IKCO members. These new and latest negotiations did not lead to any changes in the research approach.

4.6.5.2. Organisational chart

IKCO is the biggest auto factory in Iran, the Persian Gulf region, the Middle-East, Central Asia and North Africa, and employs almost 55,000 people in general and 22,000 employees in the passenger section. IKCO has a very large and complex organisational chart and having access to this chart required several permissions from varying departments. In addition, reviewing this chart and identifying the key

knowledgeable candidates based on the research criteria for the interviews was another major challenge in this study. Sometimes the chart was not up-to-date and did not mention the names of the staff, and sometimes the names were confidential. Besides the organisational chart, IKCO's senior managers'/engineers' feedbacks also helped the researcher to overcome this issue and identify the key members (who did not appear in the organisational chart) in different departments. These candidates were introduced to the research by senior members. These key people were or are working on a number of NPD activities which are related to the research interest area.

4.6.5.3. Set-up interview schedules:

Planning the interview schedules was managed by the organisation's research coordinator. However, during the field work, the coordinator changed three times and the new coordinator had to re-schedule meetings with the participants. It is worth mentioning that most of the participants were drawn from the senior managerial levels; therefore, it was difficult to set-up new meetings with them. As highlighted previously, there were several organisational changes whilst the research was in process, and the coordinators had to negotiate with the new replacement. This meant that, in some cases, the researcher had to ignore the research criteria discussed earlier. In one instance, for example, an important department head (Level 3) did not pass the research criteria but as a significant candidate the researcher had to ignore the research criteria and opportunistically interview this candidate. Communicating with the research coordinators in IKCO via phone call, E-mail and online chat on few occasions helped the researcher to re-schedule his interviews. The first visit was scheduled in 2007 by coordinator (A) and the researcher made his first visit in March 2008. Unfortunately coordinator (A) left his department and the new coordinator (B) had to reschedule all meetings with the selected candidates. The research made his second visit in October 2008. There was a third scheduled visit in July 2009 and as result of political issues during that period the third visit was cancelled. The research was suspended by the organisation for 18-months and in January 2011 the researcher

had to renegotiate his research permission with the organisation in two different occasions and finally could reschedule his interviews with a new coordinator (C). The fourth visit was made in October 2011 and the final visit rescheduled for March 2012.

4.6.5.4. National & international political issues

There were enormous challenges and major issues within the country (Iran) after the Iranian presidential election in June 2009. To ensure the researcher's safety and avoid possible difficulties and risks, some of the pre-confirmed meetings were cancelled by the participants, and after a while the government suspended all academic research run by Iranian students studying in the UK, the US, Canada, France and Australia. This suspension meant that the researcher had to organise a number of meetings with the Department of Security & Data Protection to obtain new permissions to conduct a case study in Iran. However, this political issue affected the research process for nearly 18-months from July 2009 till January 2011. The researcher had no power to overcome this level of matters and had to renegotiate several times with the company to receive new research permission with specific conditions. The renegotiation processes happened between July 2009-January 2011 by e-mails, phone calls and finally two interviews (face-to-face) in January 2011.

4.6.5.5. No overseas staff allowed to be interviewed

Because of an internal agreement between IKCO and Peugeot, the French employees within IKCO were not allowed to be interviewed. However, the researcher tried to schedule a number of interviews with the overseas candidates and finally the researcher was able to interview one of the key overseas candidates who had been directly involved in setting-up IKCO's R&D department.

4.6.5.6. Transcribing and translation

All interviews were conducted in the Persian language, recorded, and where possible additional notes were taken. The major job was to translate these interviews (nearly

60 hours) from Persian to English. It was also recognised that, apart from the time element, since the researcher's native language is Persian, there was the possibility and risk that personal views could bias any translation carried out by the researcher. As a cautionary strategy, a team of independent professional translators was employed to transcribe the recorded interviews. The professional translators transcribed the recorded interviews word-for-word in Persian; all Persian transcripts were reviewed and double-checked with the original record by the researcher. This helped the researcher to become deeply involved in the answers and to better understand the case study. Next, the translator team translated the transcripts from Persian into English and at the end the researcher double-checked the English translation with the original Persian recorded interviews as a check to avoid misunderstanding in the meaning of the responses.

4.7.   The Interview Questions

Kvale (1996) believed that high-quality interview questions should add value to the production of new knowledge, and may give excellent interview communication. The questions will change when interviewing for a conceptual analysis of the person's concepts of a topic. The research questions were drawn from the aims of thesis in this research. The research questions were developed either by adapting measures that had been validated by other researchers or by converting the definitions of the constructs into research question format. The interviews began with a short introduction to the research using simple and non-academic language and the importance of the research area for the future of the company was explained. Each interview took between 60 and 90 minutes in this study. Andrew (2003) argued that designing a research project whether it is a short dissertation, a thesis, or the main question for a large-scale research project the researcher will be asking rather than answering the question. Thus, it is important to remember what it is like to be on the receiving end. The research objectives were used to inform and guide the construction of the interview questions. The questions were selected with reference to the literature review, and

attention was paid to previous empirical works in terms of the questions and constructs used. The final interview schedules were pre-tested. Firstly, the supervisors of the thesis reviewed the final questions and provided feedback. Following on from this, the initial interviews then served as a pre-test. A manager from a British company based in Oxford was questioned to test the viability of the questions from a (English) manager's point of view. A second test took place with an Iranian manager in an Iranian organisation. This time all questions were translated into Persian and the test was conducted in Persian via Skype Video Conference. These two tests helped the researcher to assess the viability and robustness of informants' understanding and responses to the interview questions as well as the depth of the research inquiry. This pre-testing helped the researcher to provide a check on reliability. See appendices 1–14 for a list of the interview questions.

4.7.1. The Follow-up Interview Questions

Following the analysis of the first round of interviews, follow-up interviews were pursued to gather further information and for clarification. As a result of the previous experience (first visit/interviews), and based on the participants' responses and the supervisor's feedback, the follow-up research questions were designed and pre-tested in England (in English) and in Iran (in Persian). The questions were designed based on the answers that the participants gave to the interview questions in the first visit. Unusual differences, gaps and unclear answers led the researcher to review a number of new studies in the literature in the area of the research objectives. Appendices 9–12 provide a copy of the final questions for the follow-up interviews in English/Persian. The issues identified from the first round of interviews were covered in the follow-up interview round from February 2011–March 2011.

4.8.   The Importance of Ethics

Cooper & Schindler (2008b, p.34) defined ethics as, "the norms or standards of behaviour that guide moral choices about our behaviour and our relationship with others". In addition, Cooper & Schindler (2008, p.202) have also argued that, "there are always ethical considerations to be bear in mind when dealing with the research client or sponsor. Whether undertaking product, market, personnel, financial or other research, a sponsor has the right to receive research that has been conducted ethically".

This study received clearance by Royal Holloway University of London's research ethics; the researcher considered the recommendations by the universities' ethics regulation. Saunders *et al.*, (2009, p.185) also categorised a number of key ethical issues that could arise during the course of a research project:

- "Privacy of possible and actual participants
- Voluntary nature of participation and the right to withdraw partially or completely from the process
- Consent and possible deception of participants
- Maintenance of the confidentiality of data provided by individuals or identifiable participants and their anonymity
- Reactions of participants to the way in which you seek to collect data , including embarrassment, stress, discomfort, pain and harm
- Effects on participants of the way in which you use, analyse and report your data, in particular the avoidance of embarrassment, stress, discomfort, pain and harm
- Behaviour and objectivity of the researcher".

In this research the following steps were taken to ensure the research ethics. The following ethical areas were recognised in this study:

1. **Following the organisation's rules in terms of data protection:**

    The researcher has signed an official letter and accepted the organisational rules in terms of data protection. For example, bringing video camera, laptop, tablet, flash-memory card, recording video and taking photos were all forbidden and the researcher accepted all these rules. It was also forbidden to take any documents out of the organisation.

2. **The participants were fully informed about the research process:**

    This was a part of the agreement between the organisation and the researcher. Each candidate was fully informed about the research and its process before the main interview.

3. **Participants' privacy were fully guaranteed:**

    The researcher promised to keep the name of the candidates anonymous in his thesis. All candidates had the second chance to read their own transcripts. Recording the interview (voice-recording) was an option and candidates had this opportunity to choose interview with a voice-record or without a voice-record.

4. **The researcher's safety during the research was fully guaranteed:**

    Accepting the organisation's Health & Safety rules during the field work was compulsory and the researcher has signed the relevant documents.

The research question design was reviewed by the supervisors of this research. Participant and department selections and access to each department were negotiated with IKCO and all ethical matters mentioned above are considered. The purpose of evidence collection and data management procedures were clearly outlined. Each informant's anonymity was respected based on the agreements that were made between the researchers and each participant. The candidates' names did are not mentioned in this research and evidence integrity was checked through respondent validation of the written transcripts.

4.9.   Methods of Data Analysis and Inductive Approach

Hsieh and Shannon (2005) mentioned that content analysis is a qualitative research technique widely used to analyse text data and inductive content analysis of qualitative data can be seen as a way to recognise key themes, concepts and categories gained from the research. Elo & Kyngas (2007, p.107) argued that, "the aim of using content analysis is to build a model to describe the phenomenon in a conceptual form. The Inductive analysis process is represented as three main phases: preparation, organising and reporting". Chinn & Kramer, 1999 cited in Elo & Kyngas, (2007, p.108) argued that, "an approach based on inductive data moves from the specific to the general, so that particular instances are observed and then combined into a larger whole or general statement".

For example, Strauss & Corbin (1994, p.273) argued that to "answer why questions rather than being able to explain what is happening, it may be more suitable to undertake the research inductively rather than deductively. The inductive approach is about developing theory that is grounded in data systematically gathered and analysed and it allows the investigator to stay close to the collected information and to test the research themes and develop patterns". As already highlighted, this research has an interpretivist characteristic and as a result an inductive approach will be applied during the research. Table 44 shows the reasons for using an inductive approach. Thomas (2006, p.237) argued that the "inductive approach provides an easily used and systematic set of procedures for analysing qualitative data that can produce reliable and valid findings". Table 44 summarises the main reasons for using an inductive approach:

Table 44: Purposes for using inductive approach:

1	Condense raw textual data into a brief, summary format
2	Establish clear links between the evaluation or research objectives and the summary findings derived from the raw data and finally and finally
3	Develop a framework of the underlying structure of experiences or processes that is evident in the raw data

Thomas (2006, p.237)

However, Thomas (2006) believes that it is impossible to say that an inductive approach is better than other analytic strategies for theory or model development. Miles and Huberman (1994) argued that the process of qualitative content analysis begins at the beginning of data collection; it will assist the researcher to review links between concept development and data collection and will help the researcher to direct subsequent data collection towards foundations that are more useful for addressing the research questions.

Jain and Ogden (1999) argued that transcripts should be reviewed several times to identify themes and categories. After discussions with the research supervisors a coding frame was developed and the transcripts were coded by the researcher. It is important to mention that on several occasions while the coding was written new codes emerged that caused changes in the original coding frame. In this circumstance the transcripts were reviewed and re-read based on the new structure. This process was used to expand and develop categories, which were then conceptualised into broad and advanced themes. In the following paragraphs more details will be presented. In this study, the researcher stayed within the organisation and interviewed candidates about their experiences and opinions related to the NPD projects. The principle here was to get a feel of what was going on, so as to understand better the nature of the issues within the NPD related projects. The researcher's task was to make sense of the interview data that he had collected. As Glaser & Strauss (1967) suggested, when interviews have been completed, the researcher should stay close to the data and identify what can be gained directly from them. There are a number of stages to analysing qualitative data via an inductive approach. It is important to

mention that this research was manually coded and this method helped the researcher to stay closer to the research materials and engage with the collected data directly. McPherson and Ziebland (2006, p.405) believe that it is important to "identify issues that emerge during the data collection and analysis as well as those that the researcher may have anticipated from reading or experience. Analysis is very time-consuming, but careful sampling, the collection of reach materials and analytic depth mean that a relatively small number of cases can generate insights that apply well beyond the confines of the study". The steps such as preparation, organising and reporting in this study are further discussed below.

Negotiations between the organisation and the researcher took place in advance and, based on the research criteria, a number of interviewees were chosen. The research questions were designed and tested under different conditions, once in the UK with a British manager and once in Iran with an Iranian manager. As a piece of qualitative research, all interviews were taped and recorded and subsequently transcribed and where possible notes were taken. As an interviewer, the researcher was interested not only in what the candidates said, but also in the way they tried to express it. Before starting to examine the collected data, the first step was to transfer the tapes/recordings into Persian using the Microsoft Word Programme word-by-word. Each interview was transcribed from Persian to Persian and saved as a separate word document file. Each candidate's interview sheet received a unique code (label) as a matter of ethical agreement. It was agreed to keep the names of the participants private and anonymous. Saunders *et al.,* (2009, p.486) highlighted four alternative ways of reducing the time needed to transcribe audio-recordings: "A) Pay a touch typist to transcribe the audio-recording, B) Borrow a transcription machine with a foot-operated play mechanism, C) Dictate the audio recordings to the computer using voice recognition software, and finally D) Only transcribe those sections of each audio-recording that are pertinent to the research like data sampling".

In this research, a team of professional translators was employed to do all translations. Translations were subsequently compared with the original transcripts as a check for accuracy. During this stage, each recording was transcribed into Persian word format and these were sent to the interviewees, who were given the opportunity to make comments or highlight any mistakes or confidential material amongst their personal interview transcripts. As matter of research ethics the researcher did not include the interviewees' names and all of the transcripts were structured with headings and sub-headings and the candidates' unique codes on the cover page. The researcher paid a team of touch typists to transcribe his audio-recordings from Persian to Persian. However, it was important to be familiar with the collected data/transcripts and to solve this issue; the researcher personally re-read and compared all of the transcripts word by word with the original audio-recordings. This helped the researcher to become more familiar with the data and the interview materials and also he could check for possible errors. The next step was to translate the Persian transcripts into English. The researcher's mother tongue is Persian and therefore there was a possible risk of applying the researcher's personal views to the translations. To avoid this risk a team of professional translators was employed to translate all of the Persian transcripts into English. At the end of each translation the researcher personally re-read and compared the translated materials with the original records. Summarising data was the next important task.

As Kvale (1996) mentioned, researchers need to produce a summary of the key points that emerge from the interviewees' responses. This summary will reduce long statements into briefer statements in which the main sense of what has been said is rephrased in a few words. Schutt (2011, p.328) believes "that identifying and refining important concepts is a key part of the iterative process of qualitative research". Robson (2002) argued that once the researcher has an abstract of the key points that emerged from the interviews and the research framework, he / she needs to attach a copy to the set of his/her written-up notes or transcripts for further reference. Based on Saunders *et al.,* (2009) argument, organisational documents and secondary data

have been used as a means of triangulation to support the data collected by the researcher. Summarising the candidates' responses and other documents helped the researcher to identify the key concepts that appeared to be important in clarifying what had been happening in the case study. The researcher highlighted the participants' key answers to the research questions, made a short summary and wrote this next to each paragraph. Re-reading the transcripts and highlighting the summaries helped the researcher to come across more concepts, which had previously been missed. These missed concepts were gathered and they helped the researcher to set and design the follow-up interview questions. The steps in the follow-up interviews were similar to the first visit interviews. Saunders *et al.,* (2009, p.492) argued that "categorising data involves two main steps: developing categories and, subsequently, attaching these categories to a meaningful amount of data". In addition, Dey (1993, pp.96-97) mentioned that "categories must have two aspects, an internal aspect which must be meaningful in relation to the data and an external aspect which must be meaningful in relation to the other categories".

Elo and Kyngas (2007, p.109) believe that "organising the qualitative data is one the main tasks for every researcher. This process includes open coding, creating categories and abstraction. Open coding means that notes and headings are written in the text while reading it". The written material is read and reviewed again and as many headings as necessary are written down in the margins next to each paragraph to explain all of the characteristics of the content. The researcher summarised the interviewees' answers highlighted the key points and wrote next to each paragraph. In the next step related/similar summaries were categorised under a same group (sub-theme) and finally similar groups (sub-themes) were established and created the final research themes. Spiggle (1994, p.493) says that "categorisation is the process of classifying or labelling units of data and usually qualitative researchers categorise data during the processes of coding. The essence of categorisation is identifying units of data such as a page of text, as belonging to, representing or being an example of

some more general phenomenon". In this research, 20 sub-themes were identified based on the above-mentioned method.

Sub-Themes

Group 1: Knowledge known as power
Group 2: Effectiveness of information technology
Group 3: Issues on knowledge sharing in the organisation knowledge repository
Group 4: Issues on knowledge recording within the organisations
Group 5: Issues on IT facility
Group 6: Issues on access to the knowledge repository
Group 7: Political issues and IT facilities
Group 8: Top and middle management support on knowledge recording and sharing
Group 9: Repute or reputation and duplications
Group 10: Source of power
Group 11: Organisational structure
Group 12: Senior management commitment
Group 13: Lack of rewards system
Group 14: Lack of encouragement system
Group 15: Cultural distance between partners
Group 16: The role of trust in knowledge sharing and transfer
Group 17: Political influence on the IJVs' behaviour in knowledge sharing
Group 18: Knowledge acquisition, retention and creation within the R&D
Group 19: Lack of recording system
Group 20: Level of Hierarchy within the organisation

Spiggle (1994, p.493) argued that the "next step is called abstraction which builds on categorisation. Abstraction goes beyond the identification of the data and it groups previously identified categories into more general, conceptual classes". It was an important job to make links between the above-mentioned 20 sub-themes and establish the final research themes. The 20 sub-themes were identified based on the participants' answers and the data (reports, documents & news) that had been collected during the field study. It is worth mentioning that the researcher had two possible alternative ways of identifying the research sub-themes and research themes through analysing the data. In the first method, construct may result from prior themes (Mick and Buhl, 1992) or in second method construct may emerge from the

analysis itself, unanticipated but recognised as theoretically relevant (Belk *et al.,* 1988). In the first method the researcher should go back to the literature review and see what the literature review says. Then the researcher should go back to the collected data from the case study (transcripts and documents) and see if there is enough evidence to support the key sub-themes / themes that have already been mentioned in the literature review. The researcher should go back to the literature review and try to identify how such data would fit and match the themes in therein. However, this technique may cause potential problems. For example, it could lock and limit the research findings around the existing literature review, and thus prevent the researcher from presenting and exploring emergent new findings with the current reviewed literature. The second method in identifying research themes (applied in this research) is to go straight to the data collected through the interviews (transcripts, documents, reports and news) and try to identify and design new themes based on the new evidence gained from the participants' answers. The research themes were mainly established based on the evidence collected during the field work, secondary data and the literature review. The related sub-themes together created the final research themes as follows:

Theme 1: Knowledge sharing through knowledge repository

- Sub-theme: Knowledge as power
- Sub-theme: Effectiveness of information technology
- Sub-theme: Top & middle management support
- Sub-theme: Trust

Theme 2: Knowledge sharing through interaction and socialisation

- Sub-theme: Knowledge as power
- Sub-theme: Effectiveness of information technology
- Sub-theme: Top and middle management support
- Sub-theme: Repute or reputation and duplications
- Sub-theme: Source of power
- Sub-theme: Organisational structure

- Sub-theme: Senior management commitment
- Sub-theme: Lack of rewards and encouragement system

Theme 3: Knowledge transfer from international joint venture partners

- Sub-theme: Cultural distance between IKCO and IJVs
- Sub-theme: The role of trust in knowledge sharing and transfer
- Sub-theme: Political influence on the IJVs' behaviour in knowledge sharing
- Sub-theme: Lack of a recording system

Them 4: Knowledge acquisition, retention and creation within the R&D centre

- Sub-theme: Secondary and primary data, reports, organisational documents
- Sub-theme: Knowledge as power
- Sub-theme: Effectiveness of information technology
- Sub-theme: Top and middle management support
- Sub-theme: Repute or reputation and duplications
- Sub-theme: Source of power
- Sub-theme: Organisational structure
- Sub-theme: Senior management commitment
- Sub-theme: Lack of rewards and encouragement system
- Sub-theme: Cultural distance between partners
- Sub-theme: The role of trust in knowledge sharing and transfer
- Sub-theme: Political influence on the IJVs' behaviour in knowledge sharing
- Sub-theme: Lack of recording system

Finally, the next step was to gather evidence (the candidates' quotations, data triangulation and evidence from the literature review) to define the answers and explanations behind each objective. It was important to recognise and identify, why, how, when and under what circumstances these sub-themes/themes are affected. As discussed earlier, this study adopted an interpretive stance focusing on human behaviours, participants' actions and their answers to the research questions. This evidence clarified the research objectives. Hammersley (1987, p.67) states that, "a research account may be considered valid if it represents accurately those features of the phenomena, that it is intended to describe, explain, or theorise". Figure 13 shows the process of data analysis in this research.
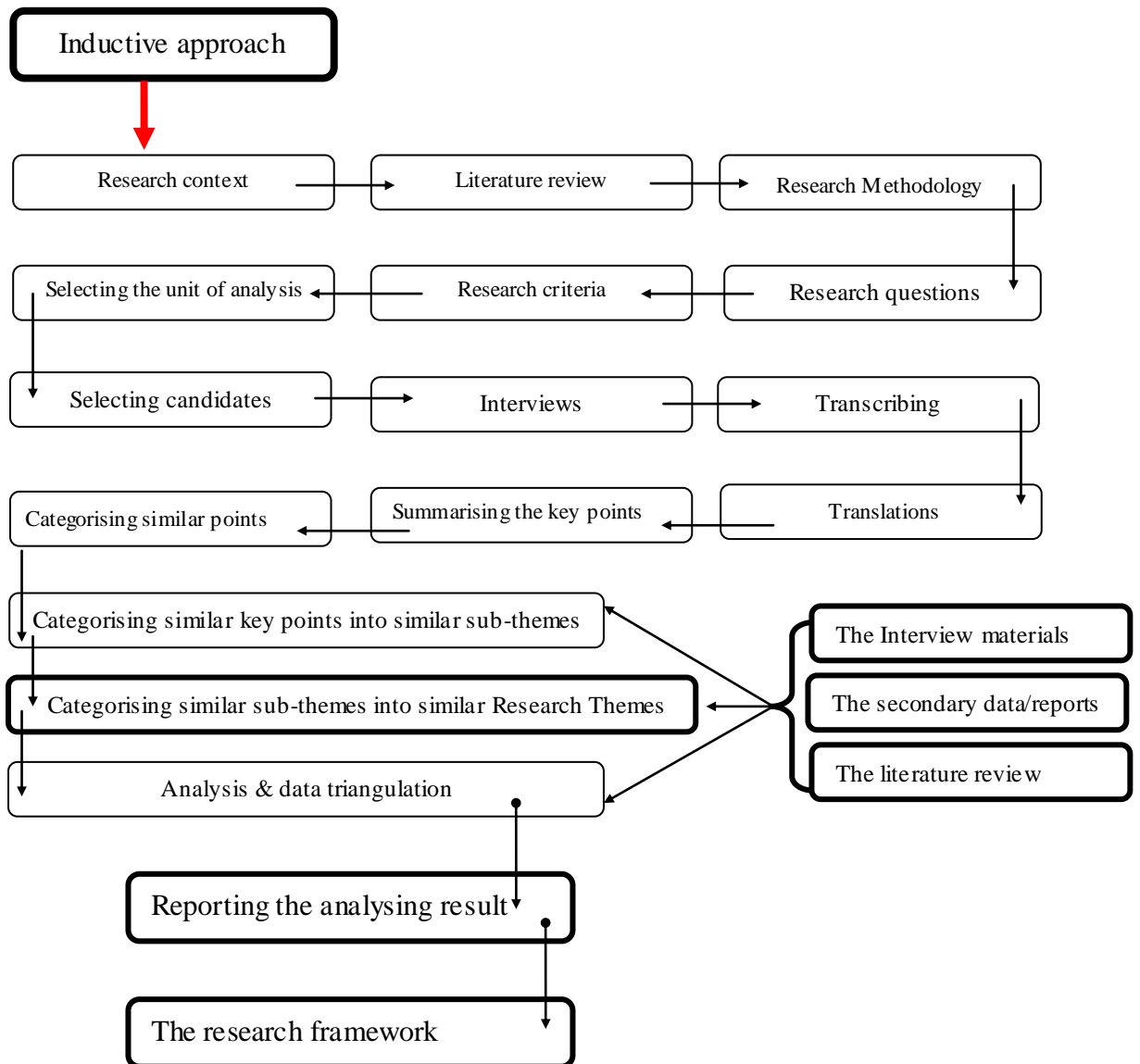
Figure 13: preparation, organising and reporting process in the research.

4.10. Conclusion

This chapter has discussed the design of the research and the factors that influenced the research strategies. It has been argued that one of the important methodological options in conducting management research is the use of qualitative methods for data collection and analysis. This qualitative research is characterised by an emphasis on describing, understanding, and explaining complex phenomena such as the relationships, samples and configurations in a specific organisation (IKCO). As an interpretivist (qualitative) researcher, questions such as what/why/how could help the researcher to understand the research questions (research objectives) in detail. Qualitative research was identified as a flexible and contextually sensitive method that allows for greater spontaneity and adaptation of the interaction between the researcher and the study participants. In addition, "with qualitative methods, the relationship between the researcher and the participant is often less formal than in quantitative research. Participants have the opportunity to respond more elaborately and in greater detail than is typically the case with quantitative methods" (Mack *et al.*, 2005, p.4). The case study method as a strategy for performing an empirical investigation was chosen for this research. It has a considerable ability to generate answers to research questions, and can be a very worthwhile way of exploring most of the theories existing in the attention of the research. The case study drew both on documentary secondary data as well as primary data in the form of interviews. The main benefit of the qualitative method in this research was applying open-ended questions during the interviews. This type of question gave a great opportunity to the candidates to respond to the interview questions in their own words. The candidates were not forced to decide and choose their answers from a set of fixed sources, as is the case with quantitative methods. In terms of the researcher's point of view, Mack *et al.* (2005) have argued that qualitative methods give the researchers more flexibility to challenge participants and ask why and how questions. The semi-structured interview has been identified as an important method in collecting evidence in interpretive research. This model of interview could help the researcher to ensure that the key knowledge management elements within IKCO were investigated.

All of the aforementioned techniques and methods ensured the validity, reliability, generalisability and ethics of the field study project.

CHAPTER FIVE: DATA ANALYSIS AND FINDINGS:

5.1. Introduction

Ahmad and Daghfous (2010) argued that Knowledge sharing takes place when one organisation is guided by the experience (know-how) of another, which can be either externally or internally. "Knowledge is created via a process by which information and know-how are shared and combined through various exchange" (Henard & McFadyen, 2006, p.41). In an organisation such as IKCO, R&D members are the knowledge-intensive and expert group; their knowledge and expertise is very important to new product development and their ability is the major strength of the product development strategy. Every R&D department is dependent on the skills, knowledge and experiences of its unit members. R&D team members can learn from each other and apply their past know-how and skills to solve new issues and develop new products or services (Zhuge, 2002; Jokinen, 1998).

This chapter reports the key findings from the empirical research based on the semi-structured interviews, and also company documents and published information relating to IKCO and the automotive industry in Iran. This study identifies four key analytical themes that are pertinent to the understanding of knowledge sharing in the new product development process in IKCO. These four themes are: knowledge sharing through knowledge repository (vertical and centralised knowledge sharing);knowledge sharing through interaction and socialisation (horizontal knowledge sharing); knowledge sharing from international partners (inter-organisational knowledge sharing); and, knowledge acquisition, retention and creation within the Research & Development (R&D) Centre. These four themes are discussed in detail below.

5.2. Knowledge sharing through knowledge repository

A key objective of this research was to understand how knowledge was captured, transferred and stored in IKCO's knowledge repository. Knowledge repository is often referred to using the parallel terminology 'organisational memory' (Wang, 1999). However, some scholars argue that organisational memory encompasses a much broader range of knowledge: organisational memory is knowledge, learned from the past organisational experience, which can be brought to bear on present decisions (Walsh & Ungson 1991). Such knowledge can be tacit or explicit knowledge; on the other hand, knowledge repository is typically associated with a computerised system that systematically captures, organises and stores an organisation's knowledge. As already highlighted, Nonaka and Takeuchi (1995) argued that nowadays, knowledge and the capacity to create and operate knowledge are considered to be the most important source of a firm's sustainable competitive advantage. As already discussed, Nonaka (1994) argued that organisational knowledge is created through a channel of communication between tacit and explicit knowledge. The latter view is especially prevalent from the information management perspective, and a computerised system enables (often explicit or codified) knowledge to be captured, categorised and stored in the system so that it can be searched and retrieved. In this study, a knowledge repository is defined as an organisational information management system, often centralised in the organisation or in the department, which captures, organises and stores knowledge. Therefore, a knowledge repository allows knowledge search and retrieval to support specific tasks within the department or within the organisation. In other words, this analytical theme 'knowledge sharing through knowledge repository' concerns sharing codified knowledge through a centralised knowledge repository, whereas sharing tacit knowledge will be discussed below under the second analytical theme 'knowledge sharing through interaction and socialisation'.

Knowledge-sharing can be seen in two main forms during the NPD processes. Firstly, vertical knowledge sharing can be seen across different levels within a single

department such as knowledge exchange between R&D members and secondly, horizontal knowledge sharing can be seen between different departments, such as knowledge exchange between the R&D and Marketing departments. Now the main function of the R&D is to generate new knowledge by recombining existing tacit and explicit knowledge (Kogut & Zander, 1992).In addition, while the analysis of the interview data shows that this knowledge exchange does happen, this study identifies three key aspects that affect the effectiveness of the knowledge repository in IKCO: knowledge as power that underpins IKCO's organisational culture (i.e. the 'soft' element); information technology in supporting the knowledge repository (the 'hard' element); and top and middle management support that is associated with the above two aspects.

The following section focuses on these three aspects by discussing knowledge as power that underpins IKCO's organisational culture, which in turn influences people's willingness to contribute to and retrieve knowledge from, the knowledge repository; the effectiveness of information technology in supporting the knowledge repository; and how top and middle management support influences the organisational culture and information technology infrastructure.

5.2.1. Knowledge as power

As already highlighted in the literature review scholars such as Mudambi and Navarra (2004) believed that, in terms of cultural issues having valuable and exclusive knowledge gives authority to the knowledge holders and can be used as a great tool within the establishment when there is a need for negotiations within or between organisations. Also, Bacon (2011) described knowledge as power for the knowledge holder. He explained that power at work is identical to the power in a battery and that if there is more voltage then there is more impact. Knowledge represents what the knowledge holder knows. Knowledge represents the knowledge holders' talent, skills, abilities, wisdom and accomplishments.

An essential function of the knowledge repository is that it serves to capture knowledge, such as success and failure of past organisational experience. Such experience provides the information and knowledge required for future decision-making. Additionally, an effective knowledge repository would allow the knowledge captured and stored in the system to be retrieved and used for creating new knowledge (Inkpen & Dinur, 1998). Within IKCO, the interview data revealed that knowledge as power characterised the organisational culture, which in turn undermined people's willingness to contribute knowledge to, and retrieve knowledge from, the organisation's knowledge repository, as evidenced below. Knowledge as power is one of the key sub-themes that emerged from the interviews with IKCO's participants from different departments and different managerial levels.

For example, the Platform X90 Manager said: *"People believe that having knowledge in the IKCO gives power to them. However, I teach and record whatever I know to others, they will also learn to do it. Of course, this is my way to tackle this behaviour among my department's members. When I know something, I also share it with my colleague. I store and share with my personnel the information and methods that I know and they are encouraged to do it as well and this becomes a tradition. But if I keep my information to myself, they will also be encouraged to do the same"* (Interview 08A, p.14, paragraph 4). It is clear that the Platform X90 Manager realised the importance of knowledge and the problem of individuals hoarding knowledge as power within his department. To encourage people in his department to contribute to the knowledge repository and share their knowledge, the Platform X90 manager tried to lead by example, that is, by sharing his own knowledge with people and colleagues in his department.

Furthermore, the Platform X90 Manager explained why people in the department kept knowledge to themselves, rather than sharing it with other people: *"People see knowledge as power. You cannot see a clear system [a centralised knowledge repository system shared by all the departments] for recording and storing the knowledge of success and failure, and if there was, then information / data /*

knowledge were recorded and none could hold and keep it any longer, because the information would be stored and shared. There is no recording/sharing culture among members and it is natural in a place where job security is poor. The more they need you, the more chance you will have to survive. Thus, you take a path that at least they start to feel that they need you. Without this, it is difficult for one to survive and it has to be like this at least superficially. If this feeling is one's heart, this will be really bad. We do have people in the IKCO who are actually like this and feel having knowledge is power" (Interview 08A, p.15, paragraph 1). [1]

In a similar vein, the Market Planning Senior Advisor said: *"Now everyone who has more information has more power; he or she could compete better here. Having information is considered an advantage. We have nearly faced a situation in which gaining more information means to keep it and not store and share it with anyone. Of course, things are much better in this department because we have friendly relationships but in any case, I cannot say that this situation has not influenced this department as well"* (Interview 16A, p.15, last paragraph). This suggests that the Market Planning Senior Advisor also believed that knowledge was power among his personnel, but he pointed out that he had approached this problem by creating a friendly environment within his department to encourage his personnel to share their knowledge.

Interestingly, the Market Planning Senior Advisor reflected on a different knowledge sharing practice in the past*: "Information was recorded and shared very effectively a few years ago, but after some time, hierarchical strategy was adopted. Hierarchy*

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[1] The researcher's personal experience was consistent with the interview data. Following the change/removal of a head of a department, several members of the same department who were close to him lost their managerial positions. They were consequently moved to lower managerial levels or moved to different departments. For example, one of the level 4 managers was moved to a position under supervision of his previous subordinate, who now became his boss. Additionally, It is important to mention that the majority of key people within the organisation had a permanent contract for a maximum of 30 years, and it is against law to sack a staff without a reasonable reason from the organisation (reasons that can be accepted by the court). Therefore, job insecurity was much to do with moving staff from an upper managerial level to a lower level, and job security was associated with securing a better managerial position or promotion, according to the interviewees.

caused the information limitation and now, if you have more information and knowledge it means you are holding more power" (Interview 16A, p.15, paragraph 3). According to the company documents, a more hierarchical structure was introduced when the organisation decided to develop and improve its organisational reporting system in the year 2000. In developing a more hierarchical structure, many more managerial positions were created within IKCO, and a key criterion for an individual to secure a higher level managerial position was to demonstrate his personal knowledge and access to knowledge. This heavily influenced the current organisational culture within IKCO.[2] The reluctance to share knowledge through the knowledge repository was not limited to the above two departments. In fact, it was prevalent within IKCO. For example, Planning & Integration Class C/D Manager echoed this sentiment: *"I had this problem and it was difficult to share the information as most of the personnel have intra-professional information but these people are not willing to share it"* (Interview 3A, p.11, paragraph 3). The above interview data supports the argument regarding the importance of knowledge for organisations and individuals within IKCO, as mentioned by Nonaka (1991), Barclay and Murray (1997), and Darroch and McNaughton (2002). Referring back to the above scholars' theories and Mudambi and Navarra's (2004), and Bacon's (2011) argument, having exclusive knowledge within IKCO provided authority to the knowledge holders. The majority of IKCO's staff believed that they could use their knowledge as an important device when the organisation or other colleague needed it. Exclusive knowledge is therefore used as a tool for bargaining and negotiation within and between departments and organisations.

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[2] The researcher's personal observation coincided with the interview data. During social meetings after the interviews, the researcher was told that IKCO's staff could secure their job position if the organisation or other colleagues needed their knowledge. If an individual shared his/her knowledge, he/she could lose power. Therefore, individuals were not willing to take risks, and tried to keep their valuable tacit and explicit knowledge, rather than contributing it to the knowledge repository.

5.2.2. Effectiveness of information technology

Davenport *et al.,* (1998) and Gourlay (2001) believed that the concept of knowledge management has been effectively controlled by information technology. Active communication enables people to exchange information and knowledge about the experiences they have gained in past projects and other colleagues can learn from these experiences. Now, it is clear that explicit knowledge can travel across nations quickly and cheaply, and that technologies such as the Internet are an enabler that allow people to access explicit knowledge around the world immediately. However, as already mentioned tacit knowledge is highly personal and can be transferred through face-to-face contact (O'Hagen & Green, 2002). The role of IT in knowledge management is widely recognised. Borghoff and Pareschi (1997) and Davenport and Prusak (1998) argued that information technology enables knowledge management activities, and that the Internet, Intranet, software and hardware are instrumental in improving knowledge management activities in organisations. However, findings of this research showed that information technology (IT) has a limited role in knowledge management in selected Iranian firms; this may be due to the lower level of IT deployment in Iran due to it being a developing country. However, Akhaven and Jafari (2008) argued that firms in Iran look at IT as a tool for facilitating some of their work and processes and not as an important enabler for knowledge management and learning. Hardaker (1998, p.72) has argued that "his research findings suggested a recognition of the need to invest in information technology". In addition, Hardaker *et al.,* (1994, p.20) argued that, "when looking at the impact of IT on various departments/functions, finance and operation within firms, as expected, they were generally found to be operating with the use of IT equipment. And this was found to be the case in over 90% of UK freight forwarders, sales/ marketing as in many other industries, seem late in fully adopting IT and in realising the full benefits to be gained".

This research showed that within IKCO, information technology was widely recognised as an important concept, but it was insufficient to facilitate the processes

of knowledge acquisition, organisation and storage. For example, the Design and Development of Engines Manager said: "*IT use has now become almost a must. If one is not familiar with the information system in the NPD, one cannot do much work*" (Interview 05A, p.13, paragraph 1). This sentiment was echoed by other interviewees. Additionally, the efficiency, flexibility and quality of IKCO's information technology were important considerations.

IKCO's main IT tool was called the 'Information System'; this was a system to which all members of IKCO had access. Each member had their own username and password, but they were given different levels of access, depending on their position within IKCO's structure. This system could be seen as similar to Microsoft Outlook. Members could send and receive emails, and attach documents and reports. Within the system there was a common drive where members could store and share documents and information with other members. The system was established and designed by IKCO's IT and Security and Data Protection Department nearly 10 years ago when data protection became an important factor for the organisation. It had been modified step-by-step by applying members' and departments' feedback over the years.

However, there was a great deal of concern about the effectiveness, flexibility and quality of IKCO's Information System due to multiple issues embedded in IKCO. First, data security and protection overshadowed the functionality, flexibility and effectiveness of the Information System. When it was first set up, the Information System had more flexibility and members could use a number of different free online software products such as Google Doc, SkyDrive, Yahoo and MSN products, and Skype. Hence the system was more compatible with other information technology available outside IKCO. However, given the organisation's increasing concerns over data security and protection, organisational members were no longer allowed to use the above-mentioned software.

For example, the Research & Entrepreneurship Manager commented: *"I used to store my documents in a online based service called Google Doc and I could invite other members to join my online folder and exchange ideas but now we are not allowed to do this as the Security and Data Protection Department believes that Google is a USA based company and there might be a possibility of data theft"* (Interview 20A, p.6, paragraph 3).

IKCO's Data Protection and Security Department believed that most of the information, data and technologies within IKCO should be kept secret and protected. The data protection policy also meant that the access restrictions applied to people in different departments and at different levels, as the HR Research Centre Manager commented: *"part of the information which is secret and classified data, the organisation has certain access levels. Some reports, books, journals and scientific resources are usually open to everyone and members can use it"* (Interview 20A, p.7, paragraph 2).

Ironically, information that was widely publicised in other countries, for example, company annual reports, was considered as confidential and secure information in IKCO. It appeared to the researcher that this level of data protection among the members aimed to conceal IKCO's weaknesses from its competitors rather than protect its own information, knowledge and technologies. This was because IKCO did not have its own innovative technologies and products, and most of its mechanical equipment and technologies had been imported from France, Germany, Korea, England, Italy and Japan.

Second, the insufficient effectiveness of IKCO's Information System was also due to the lack of understanding of departmental needs for information technology. For example, the Planning & Integration Class C/D Manager commented: *"we have connected to the IKCO's information system and this has created some limitations for us. We used to have good software facilities at the beginning of the establishment of Information System but the IT and Data Protection Departments do not know many of*

our needs (which are associated with different projects), and even if we shared these needs with these two departments, they might not have felt [understood] the needs and acted to meet our needs" (Interview 03A, p.9, paragraph 6).

The above concern regarding the lack of understanding of individual departments' needs was echoed by other departments, such as the Marketing Department. Additionally, there was also a concern that the Information System was dated and required upgrading. For example, the Deputy Director of Market Research suggested: *"in terms of facilities we are weak and our IT system needs to be updated, but since the decision makers (IT or Data Protection Departments) assumed the use of IT in this department with the System Department which is a mechanical unit, both receive the same IT facilities. We request them for software programmes or system updates. We need the system, and the decision makers tell us that they do not have budget. But I believe that this is not because of the budget. Rather, they consider us the same as the system unit"* (Interview 17A, p.11, paragraph 1).

Similarly, the Planning and Integration Class A/B Manager commented: *"due to financial problems, the IT infrastructure has not developed proportionate to the information being generated. This caused some limitations such as slow networks and filtering issues"* (Interview 7A, p.13, paragraph 3).

Third, the lack of clear guidelines on how to use the system, such as how to record and classify data, was another problem that hindered the effectiveness of the Information System. As the Design and Development of Engines Manager commented: *"The information system however has become problematic. One of the problems is the system on its own. When I send a letter or document to someone, I cannot follow up to see the final decision on my report or document, as it is not very easy to track the final decisions"* (Interview 05A, p.13, paragraph 1). The Future Strategy Senior Advisor also commented: *"the facilities that are needed to do the works are available in mechanised form but there are not systematic facilities for*

transferring and storing the knowledge. We were in the office of knowledge development in the University Relations Development Department and we were seeking to create a knowledge network throughout the company so that a database exists in which we could store/save people's knowledge and experiences for this specific purpose. Unfortunately it did not come to an end" (Interview 14A, p.12, paragraph 1).

Through further clarification with the above interviewees, it came to light that their comments referred to the use of different formats of saving knowledge in the shared drive, which caused a great deal of difficulty and frustration when individuals searched for and retrieved information. There were no clear guidelines on how to label and codify data, or on an appropriate filing system. Such frustration was reflected in the Design and Development of Engines Manager's comment: "*It is not easy to find out a clear guideline in IKCO that explains how everything should be written from the initiation to the end of project. But we knew Germany records everything in their project and if the project manager leaves the company, the next person can easily follow the project as all reports are still there"* (Interview 05A, p.7, paragraph 2).

Another example from the IKCO & Peugeot Relations Senior Advisor showed that producing reports on different objectives caused further confusion within the Strategy Department: "*we have six groups here and each have two reports everyday, 12 reports a day and monthly around 60 reports. These were the reports that our top managers would read and then the groups discussed the issues. There is no specific person to document these and each group individually reports its progress. The lockers you see there in front of the entrance have the reports from seven years ago up to now. It is easy to go and look for the information but there is a big problem. The problem is that there is no specific system and method to search within this*

massive knowledge store and it is difficult to find out specific information" (Interview 10A, p.9, paragraphs 2-3).[3]

The above issues identified in IKCO caused a great deal of knowledge fragmentation due to the lack of efficient and effective information technology to support the development and management of a knowledge repository. Every department stored its knowledge independently within the central Information System or as hard copies in the internal knowledge repository (for example, in the locker at the Department of Strategy). As many researchers have pointed out, a lack of information technology can jeopardise knowledge management processes (e.g. Davenport *et al.,* 1998; Gourlay, 2001). For an organisation such as IKCO, it is important to identify and link experts who can share their tacit knowledge by providing higher standard solutions that are delivered faster and at a lower cost in general. APQC carried out a benchmarking study in 1997 for some 28 organisations on the use of IT to support knowledge management activities.

APQC (1997, p.6) believed that: '*It is no coincidence that information technology for easily connecting people and information has blossomed at the same time that knowledge is becoming recognised as the most valuable of a firm's assets. As information technology (IT) has become our personal desktop tool and our link to each other, we grow to covet even more access to information and people's knowledge. In turn, we demand even better IT tools, ones that become part of the way we work'.*

Fourth, the lack of guidelines discussed above caused great difficulty in the categorisation and retrieval of information and knowledge stored in the Information

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[3] This coincides with the researcher's personal observation. The researcher had to obtain formal approval for research access four times during the three years of conducting the research. This was because the management changed, and each new manager had no record of the previous approval of research access.

System. For example, IKCO & Peugeot Relations Senior Advisor mentioned: *"the lockers in front of the entrance have the reports from seven years ago up to now. It is easy to go (*unlock the door of the locker*) and look for the information but there is a big problem. There is no standard system and method (*to show and help us in how to search*) within this massive knowledge store and it is difficult to find out specific information"* (Interview 10A, p.9, Paragraphs 2-3).

The Design and Development of Engines Manager also said: *"in this department there is no such specific system to record knowledge of success and failure and there is none to trace all of them and to write about problems faced along with situations. There is no action plan or any document that one can consult and see the problems from the first day to the end of the project. However, in our department, information is usually available in reports and the best person to consult is the project manager. Perhaps he/she has the technical information, tests but there is no such a specific system in the IKCO that everything is written from the initiation to the end of the project in the form of a report and you can see the progress. The Germans are a good example for this issue. The Germans record everything in their project. If the project manager leaves the job the records are there and still available. However, in our organisation, if the project manager leaves the company, the next replacement will not know where to look for the knowledge because there is no procedure for report writing"* (Interview 05A, p.7, paragraphs 2-3).

The lack of knowledge categorisation and an effective knowledge directory, caused by the lack of clear knowledge sharing guidelines, was echoed in different departments and at different levels of the organisation. For instance, the Market Planning Senior Advisor said: *"we only submit our report produced weekly or periodically to the head and the head has a place to hold and record the reports or circulate them through the information system so that others can also use them"* (Interview 16A, p.9, paragraph 9).

Similarly, the Planning and Control Senior Advisor mentioned that: "*success or failure has not been recorded in our department and we do not have a specific system; then none is in charge of recording and none can access it. In fact, the reason… to be precise one of the reasons is that consultation with the colleagues is the top priority and that is on its own right why we usually consult the people who have information, because they are not recorded anywhere*" (Interview 13A, p.8, paragraph 2).

This issue is also related to the fact that knowledge was perceived as power within IKCO. The knowledge holders could secure and save their managerial positions if other members of the organisation needed their unique knowledge. The value of having knowledge rather than contributing it to the knowledge repository was identified by Alavi and Leidner (2001). Referring back to the literature review, scholars such Davenport *et al.,* (1998); Gourlay, (2001), O'Hagen and Green, (2002); Borghoff and Pareschi, (1997); Davenport and Prusak, (1998) and Hardaker, (1994 and 1998), all argued that information technology plays a key role within organisations and effectively influences knowledge management factors (creation, transfer and acquisition). However, empirical studies in Iran show that information technology among Iranian organisations is improving slowly. Akhavan and Jafari, (2008); Farhanghi *et al.,* (2013); Valaei and Aziz, (2012), Albadvi (1999) and Gerami, (2010), all believed that information technology has a limited role in knowledge management processes in Iranian organisations and that most Iranian firms look at IT as a facilitator rather than as an important enabler for knowledge management activities. Scholars have argued that information technology in Iran is not being fully exploited. Yet Iranian organisations are trying to develop their information technology step by step. The research findings show that information technology in IKCO has not been fully developed yet and the organisation is spending time developing its IT. The results show that IKCO's members are having difficulties when they try to use their IT system. It is worth mentioning that all of the participants agreed that IT is an important tool for their knowledge management activities; however, the evidence shows that there are several issues around IKCO's

information technology. The participants all argued that the effectiveness, flexibility and quality of IKCO's IT are their main concerns. The flexibility and effectiveness of the system is problematic compared to the time of establishment in the year 2000. There are limitations with regard to having access to some of the IT facilities and the participants believed that the rules and regulations decided by the Department of Security and Data Protection are one of the main reasons that the role of information technology in IKCO is limited. Besides these issues other factors such as financial issues, a lack of clear guidelines, having different knowledge recording formats, knowledge being known as power, and a lack of a clear knowledge categorisation, all affected information technology usage among IKCO's members.

5.2.3. Top and Middle Management Support

Sweeney and Hardaker (1994) and Marisa and Yusof (2011) have argued that in an organisation, top management team has a key role and top management support is recognised as one of the important factors for knowledge management, and this is especially the case in organisations where the management team takes a more dynamic role in the business activities and decision-making (Lyles & Salk 2007). An empirical study by Abdolshah and Abdolshah (2011) showed that knowledge management in Iranian organisations is a new subject but it is growing slowly. In addition, other empirical research by Bidmeshgipour *et al.,* (2012) also showed that in Iranian organisations top managements' support and commitment plays a very important role in knowledge management adoption and the learning process. The researchers have argued that top managers can provide better opportunities to their employees to have better training and more opportunities to generate fresh ideas, and introduce new services into their organisations.

Based on the interview data, two key roles of the top management in the (lack of) effectiveness of the knowledge repository were evident: encouraging individuals to contribute to the knowledge repository; and developing guidelines for the knowledge

repository. Therefore, top management support is associated with these two aspects: organisational culture and information technology. Elements such as motivation, reward, encouragement and organisations' regulations on storing and sharing knowledge, play a central role in the top management support factor. As already mentioned, Rajan (1998) cited in Scarborough *et al.* (1999) argued that the need for reward is a personnel need among members which could be decided by top managers. In addition, creating an environment in which members feel motivated is directly related to the top managers' role (Mitchell, 1982). First, whether the top and middle management motivates, rewards, and encourages organisational members to contribute their knowledge to the organisational repository plays a key role in the effectiveness of the repository. Within IKCO, the interview data revealed that IKCO's top management did not do enough to support the development of an effective knowledge repository, and top management support was perceived as increasingly negative since the introduction of a more hierarchical structure in 2000.

For example, the Market Planning Senior Advisor mentioned: *"I cannot tell you this* [encouragement] *is being implemented 100%, because it is little by little fading rather than ameliorating in the IKCO. But before this, the motivation was mainly in the form of meetings. In addition to our group meeting, they also held meetings with senior management. This caused the people and employees to use new information. They had more skills acquisition this way. But now this is declining. I mean we see that even the senior management is not open-armed to the meetings and does not encourage it. It used to be good and everyone was at same level and there was only one manager and everybody worked together. The information was recorded and shared very effectively but after some time, they adopted the hierarchical strategy, which caused the information limitation. Now, if you have more information it means you are holding more power"* (Interview 16A, p.15, paragraph 3).

Further clarification with the interviewee revealed that face-to-face meetings were important to build trust among organisational members, which was key to

encouraging individuals to share knowledge through the knowledge repository. Despite the lack of top management support, middle managers realised the challenge of knowledge sharing among their departmental members, and introduced their own mechanisms to encourage members to share knowledge within their departments. For example, the Deputy Director of the NPD Department recalled that: *"As the department manager I give a score to the performance of the active members. However, instruction in this sense cannot exist here. A number of people gather in a timeframe and they have to give a development, product or output and this is the way we encourage them to store and share knowledge here. But the problem we often have in Iranian organisations is that the information is not more completely processed so that it can be converted to knowledge. We are trying to make this happen but it is a very hard undertaking. Everything happening in a project from A-Z should be documented and kept so that the next person to carry out a project could consult it. So it should be worked on and the processes mature so that the information becomes knowledge. But this hardly ever happens in our organisation"* (Interview 01A, p.10-12).

The practice of middle management in supporting knowledge sharing varied. For example, the Market Strategy Manager recounted the practice in the Marketing Department: *"When I, as a manager of the department, try to store knowledge or share it with my colleagues, it is natural that other colleagues will learn not to be stingy in transferring their knowledge to their colleagues. This has been the first step over the past 10 years. How to appreciate these people? It could not be financial or in the form of raises; the IKCO does not allow it. However, this mental image created for the people and department that they have this culture within themselves, motivates them by making them feel they are successful and positive. We try to encourage this feeling and stress this aspect that it is more tangible and they feel that others care about this good culture and practice they have within themselves"* (Interview 15A, p.18, paragraph 1).

In comparison, the Planning and Integration Class C/D Manager commented: *"when I started my job in this position, I had this problem. It was difficult to store and share the information / knowledge. Personnel mostly had intra-professional information and did not want to store/ share. I tried to create a store in the network and everyone could store and share his/her information in that place. This is specific to our department only and we had classified the information and we kept it here"* (Interview number 03A, p.9, last paragraph). Interestingly, there was evidence that when individuals from different departments (akin to cross-functional teams) were sent on trade missions to other countries, they were more willing to share knowledge by presenting and reporting what had they learnt abroad. This was one of the effective ways of encouraging and motivating members to share their knowledge and contribute to the knowledge repository within IKCO. Unfortunately, the above departmental effort and mechanisms did not exist in all departments.

For example, the Adapting and Integration Class A/B Manager said: *" we do not have any specific methods of reward here to motivate personnel"* (Interview 17A, p.16, last paragraph). The interviewees were also clear about what they wanted in terms of rewards for knowledge sharing, that is, that their individual contributions must be recognised by management. As the Future Strategy Senior Advisor suggested: *"the company does not have any solutions for encouraging its personnel to store and share knowledge. When they share knowledge, only honours and credits go to the employees"* (Interview 14A, p.14, paragraph 2).[4]

The findings show that there was no common method of motivation and encouragement; nor was there a reward system within IKCO. Although middle managers endeavoured to introduce their own mechanisms for knowledge sharing, there was no clear evidence of the effectiveness of these mechanisms. The lack of top

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[4] When a member of staff achieves a goal within his/her department, he/she can personally present under his/her name the achievement in the meetings or conferences in front of the top managers/ audiences and this honour and credit will be in his/her profile (CV).

management support caused fragmentation of departmental practice. It is important to mention that elements such as motivation, reward, encouragement and organisational rules on storing and sharing knowledge are playing a very important role in the top management support as Rajan (1998) cited in Scarborough *et al.,* (1999) explained that the need for reward is a personal need among members, which could be decided by top managers. Based on Marisa and Yusof (2011) argument, managers as the key staff, have an important role to play in terms of maintaining his/her staff's performance.

Second, the role of top and middle management in developing and implementing guidelines for knowledge sharing through a repository is another key aspect. Within IKCO, the lack of top management support caused fragmentation of the Information Systems as shown in the interview data. For example, the Deputy Director Quality Control commented: "*it is not systematic and it depends on who likes to store and share knowledge. As I mentioned, our knowledge management does not have clear rules or guidelines on these matters. However, in our department, group meetings are one of the tools to encourage staff to store their knowledge and share it with others. For example, one of the colleagues helps others in the meetings about statistics*" (Interview 18A, p.14, paragraph1).

Similarly, the Market Planning Senior Advisor recounted that: '*there is no clear* (specific) *guideline or system to tell us how to encourage personnel to store/share their knowledge and it is based on personal relationships. Also there is no guideline to tell us how to apply a reward system when the knowledge is shared and stored*" (Interview 16A, p.20, paragraph 1). *If we were able to share the information more easily the problem would be resolved*" (Interview 16A, p.16, paragraph 3).

The lack of clear knowledge sharing guidelines was echoed by the Internal Accessory Manager: *"It is not systematic here. For example, we had a colleague here who was one of our project managers. He resigned and left. In one of his projects he came to a difficulty and the project did not progress well. He asked the personnel to have*

internal seminars every week at work. Each person worked on a topic and they came here and they presented some information. We are currently pressed in a number of projects and there is not enough time for this. But the personnel do this among themselves" (Interview 04A, p.24, paragraph 2).

Another example was given by the Planning & Control Senior Advisor*: "It is not systematic but I can think of three methods such as series of meetings, presentations and running courses in different fields by other departments. However, I have to mention that these methods are only in our department and might not exist in the HR. There is quite the chance that if the present strategy manager leaves the department, the next one will not continue to do this"* (Interview 13A, p.15, paragraphs 1-2).

In sum, in developing and implementing knowledge sharing guidelines top management support was severely lacking in IKCO. Although there was a fragmented departmental effort towards knowledge sharing through contributing to the knowledge repository, there was not enough evidence on the efficiency and effectiveness of such departmental efforts. As Scarborough *et al.,* (1999) suggested, knowledge sharing relies on individuals being able to see the benefits of contributing their knowledge. This in turn requires management to incentivise individuals to make contributions. The role of the top management team in acquiring knowledge was recognised by Prahalad and Bettis (1986), Lyles and Schwenk (1992) and von Krogh *et al.,* (1994), who argued that gaining new knowledge results from organisational members exchanging experiences. In addition, top management plays an important role in building knowledge structures (von Krogh *et al.,* 1994). In addition, the research findings showed that among Iranian organisation top management plays a key role within the knowledge management processes. At IKCO the role of top management is also an important factor. The majority of the participants believed that IKCO's top management team members have a very important role in IKCO's knowledge management process and that a manager's behaviour could effectively influence IKCO's knowledge sharing and knowledge recording activities. However,

this empirical study showed that there are a number of factors that have effectively influenced both the managers' attitudes and the knowledge management process. The findings show that within IKCO motivation and encouragement policies are fragmented and there is no standard method among departments. Each manager and each department has different methods of motivating and encouraging staff to create, share and record knowledge. The more hierarchical structure in IKCO caused fragmentation of the staff's motivation and encouragement processes within the departments. This research also found that the lack of trust between members and managers could be seen as one of key elements that affected staff motivation and encouragement when the organisation aimed to share, transfer and record new knowledge.

5.3. Knowledge sharing through interaction and socialisation

In the existing literature, knowledge sharing happens in different forms (Alavi & Leidner, 2001). As Nonaka and Takeuchi (1995) argued, socialisation (tacit to tacit) is the sharing of knowledge in both official and unofficial ways, and there is the possibility of face-to-face meetings, emails, chats, collaboration elements and social network applications. On the other hand, in internalisation (explicit to tacit), every member of the organisation can have access to the information that is accessible on the Internet or in knowledge repositories and, as Nonaka and Takeuchi (1995) mentioned, this is closely related to learning by doing.

In every organisation, the R&D centre can be seen as a hub that gathers all possible useful internal and external sources (tacit & explicit) and enables the organisation to facilitate its new product development processes. However, there are a number of elements such as cultural, technological and organisational factors that affect the knowledge sharing process within and between organisations (Mudambi & Navarra, 2004). As Foos *et al.* (2006) argued a number of aspects such as trust influence the knowledge sharing. Szulanski (2003) believed that a lack of experience on the recipients' side makes knowledge sharing fragmented. Scholars such as Smith *et al.*,

(2007); Nonaka and Takeuchi (1995) and Bock *et al.,* (2005) all argued that individual members play a very important role in the knowledge sharing process. Yet, within an organisation there are always knowledge sharing barriers among R&D projects. These barriers include codification, information technology support, lack of motivation among members, lack of time and suitable resources, and communication issues (Santos *et al.,* 2012).

In addition, the second analytical theme that emerged from the interviews and the analysis of the company documentation was the constrained manner of knowledge sharing through interaction and socialisation within IKCO. Sharing knowledge at IKCO appeared to be conducted primarily via codification and the knowledge was embedded within materials (reports, plans). In contrast, the sharing of knowledge through the transfer of experience and the establishment of shared contexts such as through face-to-face interaction appeared secondary to the generation of information. Furthermore, IKCO appeared to actively hinder the sharing of knowledge through socialisation. In this section, a number of factors that derived from the interviews that impact on knowledge sharing through interaction and socialisation inside the company are discussed. These factors include the emphasis on repute or reputation (Davenport & Prusak, 1998) placed by individuals as a source of power, the organisation of the company, senior management commitment, and the lack of reward and motivation systems.

Conflict between departments appeared to hamper knowledge sharing within the organisation. One source of this conflict was job duplication across departments. The Materials Research Centre Manager commented (with some frustration) that*: "unfortunately we have many departments who do parallel work and duplicate each other in IKCO and to reduce this, all duplicated positions and functions should be converged in one direction. For example, our lab here, there was a time IKCO had a lab and they wanted to integrate it. So they created ETRAK and then SAPCO established its own lab and then problems happened and each lab was doing the*

same tests in two different locations and interestingly they were ignoring the results of each other's tests. They did not approve the results and they replicated the tests. In the quality and engineering departments we have this issue too" (Interview 35B, p.19, paragraph 1). This suggests that departments perceived other departments as a potential threat to their existence.

The Deputy Director of Strategy Department also commented on job duplication, indicating that this repetition of roles was deliberate: *"we naturally have this duplication here within IKCO and departments. We establish a department or a position to fulfil a function. For example, I employ someone to bring me tea, but if I am not satisfied with the tea he brings then I employ someone else and now you ask me why I do not fire the first one and the answer is, I cannot because maybe I have a reason, he or she might be a relative to Mr X"* (Interview 30B, p.9, last paragraph).

The importance and impact of family ties in creating and sustaining job roles in Iran was further supported by the independent interviewee: *"Iranian priority at work first is family - to help them, extended family; if it is not extended family, it may be old school friends and when you run a business you try to find positions for each of those people and you may create positions even if it is not required"* (Independent interviewee, p.15, paragraph 2). Although the exact level of job duplication in IKCO was not clear, some indication that this duplication was extensive was suggested in the following reflection by the Market Strategy Manager: *"the effects of job duplication among departments continued until now and now the top managers recognise it and they are starting to change the organisational structure and job specification but it will take time"* (Interview 33B, p.21, paragraph 1).

The research findings show that job duplication has become a problem for IKCO, hampering the organisation's effectiveness. Awareness of job duplication within the company not only makes IKCO cumbersome as an organisation and introduces a level of competition between departments but it also generates distrust between

individuals. This constrains the willingness with which individuals are prepared to share their knowledge and expertise with others (McEvily *et al.,* 2003; Renzl, 2008).

One reason for individuals' inhibition is job security, engendered by the role duplication. The Platform X90 Manager explained why people in the department kept knowledge to themselves, rather than sharing it with others: *"There is no recording/sharing culture among members and it is natural in a place where job security is poor. The more they need you, the more chance you will have to survive. Thus, you take a path that at least they start to feel that they need you. Without this, it is difficult for one to survive and it has to be like this at least superficially. If this feeling is one's heart, this will be really bad. We do have people in the IKCO who are actually like this and feel having knowledge is power"* (Interview 08A, p.15, paragraph 1).

In a similar vein, the Market Planning Senior Advisor cautioned: *"Now everyone who has more information has more power; he or she could compete better here. Having information is considered an advantage. We have nearly faced a situation in which gaining more information means to keep it and not store and share it with anyone. Of course, things are much better in this department because we have friendly relationships but in any case, I cannot say that this situation has not influenced this department as well"* (Interview 16A, p.15, last paragraph). Having a reputation as an expert in the company could be used to help secure an individual's position, or be used as a bargaining device to secure future promotion.

In this company, job security related to maintaining your position within the hierarchy rather than losing your occupation. Iranian state law makes it difficult to make people redundant but has little to say regarding the level or position that an individual is employed at. In other words, the concept of 'constructive dismissal' is

unusual in Iran. One stark illustration of this point is the researcher's own experience in attempting to secure access to IKCO.[5]

Job duplication and the consequent growth in personnel within IKCO made the company difficult to manage effectively. One sign of that was the formal restructuring that took place in 2000. This introduced new layers of hierarchy, creating additional managerial positions and ushering in a more formal planning approach. Interaction between departments appeared to be formally structured and process based, with roles strictly delineated. The Technology Strategy manager explained that: *"we receive information proportionate to our needs; if there is a problem with the parts in the production line, the information should be communicated to quality department"* (Interview 34B, p.23, last paragraph). Similarly, the Market Strategy Manager stated that: *"market research is carried out in this department to support strategic planning and we provide this information to the Strategy Department and R&D Department. We plan the market study and a private institute operates it"* (Interview 33B, p.11, paragraph2).

It is noteworthy from these comments that the candidates emphasised activities that passed on information rather than the active sharing of knowledge. In other words, there was an emphasis on the explicit and codifiable, particularly through reports, rather than the sharing of tacit knowledge. This point was supported by the Deputy Director of the Strategy Department, who commented that: *"cooperation among*

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[5] Following the change/removal of a head of a department, several members of the same department who were close to him lost their managerial positions. They were consequently moved to lower managerial levels or to different departments. For example, one of the level 4 managers was moved to a position under the supervision of his previous subordinate, who became his boss. Individuals are typically employed on a permanent contract for a maximum of 30 years, and it is against the law to sack an individual without a reasonable reason (a reason that will be accepted by the court) from the organisation. Therefore, job insecurity had much to do with moving staff from an upper managerial level to a lower level, and job security was associated with securing a better managerial position or promotion, according to the interviewees.

different departments is happening but is sometimes affected by bureaucracy" (interview 30B, p.11, paragraph 4).

The implication here was that there was a strict protocol regarding the chain of command through which interactions took place. That is not to say that interaction between departments was always rigidly regimented. Some elements of face-to-face interaction did take place, typically in response to problem solving. The Prototyping Manager for example, explained that:

"we have a project control department here at R&D that hands us our weekly timetable and task list every Saturday. If we do not come to a conclusion, we hold meetings and we complete the task through internal meetings" (Interview 2A, p.10, last paragraph. However, even in the last quote, the emphasis placed by the Prototyping Manager was on the explicit (timetables, task lists) rather than on the tacit, in other words, what could be measured and assessed by the hierarchy.

Just as interactions between departments appeared rooted in formality, interactions within departments were equally formal. In the Planning Department, for instance, the Planning and Integration Class C/D Manager clarified this: *"since we work cross-functionally, my personnel are directly in contact with me and planning personnel and project personnel give me the report on the project progress"* (Interview 3A, p.4, paragraph 4).

Note again, the emphasis of the Manager was once more on the explicit exchange of information in the form of reports. In contrast, in describing the setting up of the R&D department, the independent interviewee pointed to a greater emphasis on the sharing of knowledge and expertise through socialisation in the past: *"We locked our selves away for a weekend and we designed the release form, a very rough process*

and we said this will get you going" (Independent interviewee, page 29, paragraph 2).[6]

The adoption of greater hierarchy by IKCO also impacted on the transfer of knowledge within the company due to the unwillingness of senior managers to encourage and support the transfer of expertise and know how. Just as individuals lower down the hierarchy were fearful of losing their positions, senior managers were similarly concerned. An indication of this was given by the Market Planning Senior Advisor: *"I mean we see that even the senior management is not open-armed to the meetings and do not encourage it. It used to be good and everyone was at same level and there was only one manager and everybody worked together. The information was recorded and shared very effectively but after some time, they adopted the hierarchical strategy, which caused the information limitation"* (Interview 16A, p.15, paragraph 3).

This suggests that senior managers were similarly concerned about the implications of sharing knowledge with their staff as the staff themselves. Consequently, senior managers did not appear to set an example in seeking out opportunities to socialise and share knowledge with their staff.

Marisa and Yusof (2011) argued that managers as the key staff have an important role in maintaining the personnel's performance. Exceptionally, one or two middle managers did appear to appreciate the benefits of setting an example. In one case for example, the manager appeared to recognise the personal value of reciprocity and altruism in generating knowledge flows within their department. The Platform X90 Manager explained: *"people believe that having knowledge in IKCO gives them*

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[6] However, the independent interviewee went on to bemoan the subsequent lack of reflection within the department: "That process is still working 10 years later. There are 3 processes such as the release form for manufacture; we said put this process in now and then we will improve it. But they never took them out and none stood back and said this was ok at that time but now we have the computers, databases, and let's do value stream analysis and take out what we need " (Independent interviewee, page 29, paragraph 2).

power. However, I teach and record whatever I know to others, they will also learn to do it. Of course, this is my way to tackle this behaviour among my department's members. When I know something, I also share it with my colleagues. I store and share with my personnel the information and methods that I know and they are encouraged to do it as well and this becomes a tradition. But if I keep my information to myself, they will also be encouraged to do the same" (Interview 08A, p.14, paragraph 4).

In another case, the manager acknowledged that leading by example was a deliberate attempt to counter the prevailing pattern of behaviour within IKCO. The Market Strategy Manager argued: *"When I, as a manager of the department, try to store knowledge or share it with my colleagues, it is natural that other colleagues will learn not to be stingy in transferring their knowledge to their colleagues. This has been the first step through the past 10 years"* (Interview 15A, p.18, paragraph 1). However, these managers were the exception rather than the rule at IKCO.

Another contributory factor inhibiting interaction and knowledge transfer within the company was the lack of a central clearly defined rewards strategy that promoted the sharing of tacit experience. This left the rewarding of individual contributions to a more ad hoc, localised approach, dependent upon the interests and whims of individual departmental managers. As the Market Planning Senior Advisor noted: *"there is no clear* (specific) *guideline or system to tell us how to encourage personnel to store/share the knowledge and it is based on personal relationships and also there is no such a guideline to tell us how to apply a reward system when the knowledge is shared and stored"* (Interview 16A, p.20, paragraph 1). This seems to imply that the transfer of knowledge depended upon the level of trust built up between individuals and their managers. Similarly, the Adapting and Integration Class A/B Manager said that: *"we do not have any specific methods of reward here to motivate personnel"* (Interview 17A, p.16, last paragraph).

Lacking centralised direction, some managers had developed their own ways to encourage knowledge transfer. One manager, for example, used face-to-face meetings to encourage socialisation and thereby the sharing of knowledge. The Deputy Director Quality Control said: *"As I mentioned, our knowledge management does not have clear rules or guidelines on these matters. However, in our department, group meetings are one of the tools to encourage staff to store their knowledge and share it with others. For example one of the colleagues helps others in the meetings about statistics* (Interview 18A, p.14, paragraph1).

As the manager made clear in the quote, this appeared to be a deliberate personal act as a reaction to the lack of direction from the centre. Another manager, in the NPD department, used a points system to encourage the sharing of expertise within his department. The Deputy Director clarified*: "As the department manager I give a score to the performance of the active members. However, instruction in this sense cannot exist here"* (Interview 01A, p.10-12). The danger of this ad hoc approach is that socialization may not be encouraged consistently within the company.

The ad hoc approach appeared to extend across the organization. Somewhat surprisingly, within the planning department there seemed to be no systematic process for knowledge sharing. Rather, knowledge seemed to flow haphazardly and outside the control of the department. In a revealing discussion, the Planning and Control Senior Advisor explained the process through which knowledge gaps were addressed: *"a method, which is more general at the moment, is through our colleagues in the education department. For example, the colleagues identify a course, or a need or a task, and then they ask the relevant department to come here and present us with the information on the subject. I remember, last year there was a strategic course on the strategy culture and the strategy department personnel went to the education department and managers from other departments also went there and the information was shared"* (Interview 13A, p.15, paragraph 1).

While the manager pointed to the importance of face-to-face interaction as a means of transferring knowledge, the process itself appeared to have been initiated outside of the department. This suggests that the manager did not perceive his tasks to include the encouragement of knowledge transfer within his department. Other managers pointed to the lack of meaningful work and fiscal rewards within the company. This was seen to be detrimental to the exchange of knowledge within IKCO. In a perceptive explanation, the Deputy Director of SAPCO Test & Research Auto stated: '*highly educated knowledgeable individuals need motivation to stay. By assigning more technical tasks I try to satisfy my personnel. Sometimes they need to be satisfied technically and I try to motivate them to work this way. However, another important way of motivation is simply through giving them a good salary, which is limited and this is IKCO's main problem. A company in the UAE continually advertises and encourages employees and graduates of certain places to go and work there with a salary 3-times as much we pay here. What does this mean? It means that the personnel cannot always remain the same*'' (Interview 36B, p.14, paragraphs 1-2).[7] Here the manager appeared to be acknowledging that he was virtually powerless to motivate his highly educated staff because of the lack of suitable work and the inability to compete on a fiscal basis.

This second theme has explored the level of knowledge sharing in IKCO through interaction and socialisation using the interviews conducted in the field. In the view of the departmental managers, the company did not encourage such knowledge sharing although exceptionally some middle managers attempted through example to establish shared contexts and generate trust. However, individual efforts were mitigated by several inhibiting factors within the company at large. The restructuring and the introduction of additional layers of hierarchy appeared to entrench job duplication within IKCO. This sowed the seeds of distrust among individuals who

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[7] Here the researcher's personal experience could be used as an example. A key contact coordinator in IKCO left the company prior to the fieldwork starting and moved to one of the Persian Gulf's Arab Countries. In explaining why he was leaving the company, the coordinator mentioned similar reasons i.e. monetary rewards as the cause of him leaving the organisation.

feared for the sustainability of their positions within the company and therefore attempted to keep hold of their knowledge and expertise. The sharing of personally held knowledge did not lead to reciprocity but rather to position insecurity. Other factors did not act as a counter weight to these fears. Senior managers, fearing for their own positions, neither lead by example, nor attempted to put in place processes that would motivate and reward individuals.

Consequently, when knowledge sharing through socialization did take place, this was very much on an ad hoc emergent basis directed by the individual whims of specific managers. To paraphrase Nonaka and Takeuchi (1995), IKCO as an organization did not systematically establish a field of interaction through which individuals could share their experiences and mental models. Within IKCO, a lack of top management support, job duplication, the impact of family ties, the organisational hierarchy, job security, growth in personnel and the lack of a central clearly defined reward and motivation strategy, all negatively affected knowledge sharing through interaction and socialisation.

5.4. Knowledge transfer from international joint venture partners

International joint ventures have become a common type of entry method into overseas markets; entry into the new market is quicker and has lower risks. It has been argued that learning has always been recognised as one of the main driving forces of joint venture establishment (Lane *et al.,* 2001; Khanna *et al.,* 1998; Simonin 2004). Chrysostome *et al.,* (2013, p.88) stated that, "joint ventures permit acquisition of new know-how and consequently present a good setting for the development of strategic competencies". However, Beamish (1988) highlighted that sometimes, the expected learning may not take place, and the partnership between the joint venture partners may result in conflicts relating to power, cultural difference and personal interests.

The third analytical theme delineates knowledge sharing with international joint venture partners (IJVs). IKCO had several key international partners (e.g. from France, the UK, Germany, and Korea) involved in different types of new product development projects. In this study, two international partners, namely Peugeot from France and **P**roject **A**erospace **D**evelopment (PAD) (which later became First Automotive Company) from the UK, were chosen to be investigated, as IKCO's experience of working with these two partners provided a clear contrast regarding knowledge sharing with international joint venture partners. Going back to the 1990s, a company called Project Aerospace Development (PAD) had an initial agreement with IKCO. According to an interview with a key informant from PAD, who led the joint venture project with IKCO (Interview 35B, Independent Interviewee), the company specialised in prototype body-in-white and had a Family Sedan project in Taiwan that would have been the first Chinese car. PAD had a car with 20 body shelf at VP level (verification prototype level), and it was the last prototype before production. PAD had designed all of the databases but having that debt put the PAD project into difficulties and in order to survive, the company had to look around the world for another potential customer. PAD used that project as a fast track to find a new customer (automaker). PAD found two potential customers; one was Argentina and the other was Iran. In the end, PAD went to the Iranian market and collaborated with IKCO, eventually developing that project. As a result of this collaboration, PAD survived and started to regain its strength. It acquired another company called Press Patents that was specialist in quality measurement; this was a separate company besides PAD and the First Automotive Group. Under the First Automotive Group there were three main companies: Press Patents, PAD and Project Management International. PAD agreed to help IKCO to develop an Iranian National car and an R&D centre, and the final agreement was signed in the UK in 1995.

PAD suggested that IKCO use the SAMAND as the learning curve for all of its key engineers. This would allow IKCO to learn on the job rather than having to wait for a few years to set up its R&D centre. Based on this agreement, PAD first trained 13

graduate engineers in IKCO. They were mostly fresh minds who had not worked in IKCO for a long time; therefore there was no bad practice or old thinking. The only exception was a senior engineer who was 10 years older than everybody else, who became the team leader. PAD brought these Iranian engineers to the UK and they became the founders of the R&D centre. In the second stage, PAD sold its intellectual property rights (IPR) to IKCO, which helped IKCO to break away from Peugeot's monopoly. To gain further independence, IKCO started to build its own R&D centre with the help of PAD. IKCO used the SAMAND project as its first pilot project between 1994 and 1997. IKCO's R&D centre building was constructed during this period, and PAD trained and closely worked with the architects on building the R&D centre. The Introduction to Iran Khodro Group (2013, p.4) mentioned that since 1962, IKCO has developed its capabilities and become the biggest industrial group in the region that performs industrial and service activities in the automotive sector in both passenger and commercial vehicles. It has 1,000,000 units of production capacity and employs about 21,000 people. In addition, IKCO aimed to be a world-class car manufacturer. It founded its own R&D, engine development and test centre, together with investing in the latest technology production machinery, equipment and facilities, which were established in cooperation with leading countries in automotive industry in Europe including France (Peugeot).

However, as the Deputy Director of Strategy Department mentioned, having France (Peugeot) as a key partner has had both advantages and disadvantages for IKCO. He argued that: *"20-30 years ago, and just comparing the situation, international automakers could see that Iran was in the war and also was under sanctions and the Peugeot Company was the only option that IKCO could set an agreement/partnership with. Peugeot was a good choice at that time; however, after some time, IKCO became worried about the renewal of the policies. Unfortunately Peugeot is doing the same policy as 30-years ago and this is the negative point"* (Interview 9A, p.10, last paragraph). Iran Khodro (2013 A) mentioned that in 1988 after the Iran-Iraq war ended, a three-year contract for the production of the Peugeot 405 sedan was inked

under the supervision of IDRO (Iran's Industries Development and Renovation Organization) and the Ministry of Industries. In addition, and due to the shutdown of the Talbot Factory, in 1989 IKCO made other new agreement with its French partner to assemble the Peugeot 504 engine on its popular Paykan body, and this was named the Paykan1800.

In 1991, production of the Peugeot 405 started and this was followed by the establishment of SAPCO. In 1994, IKCO aimed to set up a 7-year strategic programme. It wanted to increase its production volume and the percentage of locally made parts and most importantly, it aimed to form an R&D centre. In 1999, the production of the Peugeot Persia (Peugeot Pars), a facelift of the Peugeot 405, started at IKCO. In 2002, the mass production of the Samand as the national car began. The Samand was a model based on the Peugeot 405 platform with higher technology and a new face, all of which was developed by IKCO. After the launch of the first model of the Samand by IKCO, Peugeot decided to launch its popular 206 model in Iran in the same year and IKCO started to assemble a number of different variants of the 206. In addition, in 2005, a new product was successfully launched into both the national and international markets by IKCO. The new car called the Peugeot 206 SD, was jointly (IKCO – Peugeot) designed and developed in IKCO. Most recently in 2011, IKCO started to assemble the Peugeot 207i, which was specified for the Iranian market by Peugeot.

It is clear that IKCO has learned from its different business partners since 1962, when it started to assemble the Hillman-Hunter (PAYKAN). Finally, in the year 2001, IKCO launched its first locally developed automotive (SAMAND) into the Iranian market and since 2002 IKCO has been exporting this car overseas. However, this development, which began in 1962 and went on until 2000, took longer than expected. For example, HYUNDAI –MOTOR, was established on 29th December 1967, five years later than IKCO's establishment. Now it is recognised that there is a difference in these two automakers' place in the world automaker rankings and also in their product quality and quantity. The interview data revealed several key factors

that influenced IKCO's experience of working with its two key international partners, and hence its experience of knowledge sharing and transfer. Below, three key factors influencing IKCO's experience are discussed: the cultural distance between IKCO and its international partners; the issue of trust in knowledge sharing; and the political factors that influenced international collaboration.

5.4.1. Cultural distance between IKCO and international partners

As discussed earlier, Lewis (1990) and Makion *et al.* (2007) argued that the collapse rate of IJVs is far higher than the success rate and, in addition, learning within IJVs remains a difficult journey, owing to the cultural, institutional and geographical distances. However, Grant (1996) and Zander and Kogut (1995) argued that nowadays, organisations are developing more complex networks of communication with their partners. Organisations must have a good strategy to retain, develop, organise, transfer and utilise their resources and this requires systematic knowledge management, which has a significant influence on a firm's strategy formulation and performance. However, as already discussed in the earlier theme, IKCO's knowledge management system is not fully developed and is not acting effectively. A good example by Inkpen (2008) showed how IJVs in the US automotive industry (between GM and TOYOTA) could work well. However, as has been previously acknowledged, there is always the risk of losing one side of an IJV. Cultural differences and diversity in the final goal can be seen as key factors for this loss. For example, Yan and Gray's (1994) findings showed that the local partner's knowledge makes the foreign partner dependent on the local partner. However, once the foreign partner increases their knowledge of the local market, the instability of the IJV becomes possible. On the other hand, Inkpen and Beamish (1997, p.188) argued that "the local partner may acquire the skills and knowledge of its international partner, making the IJV redundant, as the international partner's skill and knowledge are no longer needed". In particular, the cultural difference between IKCO and its international partners was repeatedly mentioned by a number of the interviewees. For

example, the Planning & Integration Class A/B Manager mentioned that: *"we have worked with the English and Germans. The Germans have everything documented and written and the documents are accessible. The French hardly transfer the knowledge and it is difficult to understand their documents; they are not logically easy to follow. Well, first I feel they think if they transfer their knowledge to other companies they are working with, the partner will one day overtake their place. Second, there is the inaccessibility of their documents. They lack naturalness and are not easily read. Another point is the self-pride the French have. Imagine they did something wrong and you tell them about it. They would hardly listen to you. They think they are the King of knowledge and they know everything"* (Interview 7A, p.5, last paragraph).

Similarly, the Planning & Integration Class A/B Manager commented: *"When IKCO was producing the PAYKAN 20-years ago, IKCO made arrangements with Peugeot. IKCO was not at the organisational knowledge level that is now. The basis of the first relationship was established then it continued. Perhaps if IKCO was to make new relationships with a French company, the requirements and documents of the contract would be different and knowledge transfer would be much better than what is now"* (Interview 7A, p.6, paragraph 2). The Deputy Director of Strategy Department echoed this sentiment: *"The French, generally speaking, are not really good at giving data and information to their partner. If you asked the German, English, Italian they are very good compared to the French and off course the Korean and the Japanese are much better"* (Interview 9A, p.6, last paragraph).

Similarly, the Deputy Director of Quality Control said: *"*[based on my work experience] *The Germans are more open to questions. Renault is better than Peugeot in this respect. The knowledge they give is available and can be found in many books. The problem is that they have given us the systems of problem solving, management but in a sporadic manner and in pieces. They have not told us how they have designed the system. They only give us the results; they also do not give us the integration of the system. They have given us an island system. We have worked for*

ten years with these systems; even the personnel in the production unit are confused how these systems work" (Interview 18A, p.5, paragraph 1).

The above evidence points to the fact that the Iranian prefer a structured approach to knowledge acquisition that involves a high level of knowledge codification. This also indirectly reflects the fact that tacit knowledge is hard to transfer (Nonaka & Takeuchi, 1995), and effective transfer of tacit and explicit knowledge requires different mechanisms. For example, tacit knowledge is more easily transferred through interaction and socialisation, whilst explicit or codified knowledge can be shared through a knowledge repository, as discussed above.

5.4.2. The role of trust in knowledge sharing

Trust at an organisational level is a very important part of absorptive capacity as it encourages the 'teacher' organisation to actively support the 'student' organisation to understand the knowledge that it is offering. This is unlikely to happen except when the teacher is confident that its partners (students) are dependable and will fulfil their duties (Johnson *et al.,* 1996). In addition, Inkpen and Beamish (1997) mentioned that a willingness to risk weakness is one of the dimensions of trust. In this case, the condition for using and sharing valuable and hidden information and tacit knowledge is a key factor. Chiles and McMackin (1996) argued that, the greater the trust in the relationship between IJVs, the greater the inclination for parties to share and exchange information that may make them vulnerable. Parkhe (1993) found that differences in partners' nationalities and cultures would negatively influence the success on an IJV, mainly in terms of the ability to benefit from the knowledge that can be transferred from the other partner.

Among IKCO's members, the concept of trust was acknowledged as one of the important elements that could facilitate or hinder the intra-organisational or inter-organisational processes, especially when knowledge sharing was concerned. In this study, trust emerged as a key issue between IKCO and its international joint venture

(IJVs) partners. The trust issue was easily identified when staff or the IJVs did not want to share and store their own knowledge with their colleagues or the business partner. The staff and IJVs did not fully trust each other and did not (fully) want to store their knowledge and share it with their colleagues and partners. The example of the successful joint project (SD206) and the failure of the domestic project show that the level of trust between IKCO and Peugeot was problematic. The interview data indicates that in the successful joint project (SD206) Peugeot did not fully present detailed information about the steps they took in their activities and, instead, they just presented the final results. This made it very difficult for IKCO to learn from Peugeot.

Evidence provided by the candidates show that the French did not trust the Iranians to present all of the detailed information regarding the successes and failures they had had during the SD206 development. For example, the French did not let IKCO's engineers and experts attend the process of the SD206 safety test in France; according to some of the interviewees, this was because the French did not want to present all of the detailed information, and furthermore they did not want to show them (IKCO's experts) the process of these important tests.

The difficulty of working with Peugeot was mentioned by a number of the interviewees. For example, the Planning & Integration Class A/B Manager said: "*I had difficulties working with the French. We have worked with the English and Germans in the past. The Germans have a different working style - everything documented and written and the documents were/are accessible. The French hardly transfer the knowledge. Well, first I feel they think if they transfer their knowledge to us, as their domestic partner in Iran, we will one day overtake their place*" (Interview 07A, p.5, paragraph 5).

Another example was given by the Planning and Integration Class C/D Manager He said: "*it was difficult to get inside Peugeot for us. We have had this problem with them. We have had a hard time getting information/knowledge from them and this is*

based on the nature of trust between us and the French" (Interview 03A, p.10, last paragraph).

The case here was that, on the one hand the French (IJV) did not trust their Persian domestic partner and did not want to store and record their (Peugeot's) important knowledge in IKCO's knowledge repository; on the other hand the Iranian side did not have enough experience to play different games and find alternative ways of gaining knowledge from their French partner. The interviewees felt that Peugeot was concerned that IKCO would soon become a future competitor in the region, and this was one of the reasons why Peugeot was unwilling to store any valuable knowledge with IKCO.

Furthermore, the Adaption of Engine and Power Transmission Manager commented: "*when there is a matter of having access to the knowledge between us and the French the issue can be seen easily. The problem is that the French are famous for being proud and self-satisfied. For example, if you talk to an English person or a German person, they would more easily give the information and knowledge with respect to the French [8]. The French only see themselves and when it comes to storing information, they hardly do it"* (Interview 6A, p.5, and paragraph 1).

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[8] For example, German Daimler Mercedes-Benz established a site in 1971 in Tabriz City called IDEM Company. IDEM Company develops and produces very advanced diesel and CNG engines with different horse-powers, used for buses, mini-buses, and as engine for agricultural and industrial purposes. Daimler Mercedes-Benz imported and supported all mechanical and technical elements and also the IDEM's personnel training was under German supervision. Daimler Mercedes-Benz also established an assembly line in IKCO to produce the Benz E class in Iran. The English helped IKCO in the 1960s by establishing an assembly line in Iran (IKCO) to produce the Hillman Hunter (an advanced car in its time) and the English agreed to transfer 100% of the technology to the Iranians step by step. The percentage of domestically produced and developed auto-parts increased year by year, and in the 1980s the Hillman Hunter was made in Iran 100% domestically. Most recently, part of the design and testing of IKCO's national car (SAMAND) was done jointly by English and German companies.

This viewpoint was shared by the Deputy Director of Quality Control: "*The Germans are more open to questions. The knowledge they give is available and recorded. In the case of the French there is a problem; the problem is that they have given us the systems of problem solving but in a sporadic manner and in pieces. They have not told us how they have designed the system; they only give us the results. They also do not give us the integration of the system. They have given us an island system*" (Interview 18.A, p.5. paragraph 1)[9].

The different levels of trust between IKCO and its two partners, Peugeot and PAD, were reflected in a number of the other interviewees' comments. For example, the Internal Accessories Manager said: "*Fortunately our relationship with the English was in a friendly atmosphere and there was no such thing as let's hide the information and let's not give it to them. They were not like that at all. But we do not have the same kind of friendship with the French. The French do not transfer/store their knowledge to us; they hide it as they have a feeling of superiority*" (Interview 04A, p.5, paragraph 4).

Similarly, the Deputy Director of the Strategy Department (International Relationship) commented: '*Luckily I do not work with Peugeot. I mostly work with the Japanese. The Japanese have a culture of acceptance. For example, when they promise something they will fulfil it. On the other hand, the French are very cunning people and they are the kind of people who look from up to downward. But the Japanese are more similar to the Iranians and I personally believe that choosing Peugeot was not a good choice. They are not really good at giving (storing) data/*

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[9] The researcher asked the French (Peugeot members) who were based in IKCO to have a number of interviews for his research purposes. The French did not accept and refused to talk. They mentioned that they (the Frenchs in IKCO) do not have permission from their head office to do so. They are not allowed to talk to the Iranian media, reporters and researchers. The researcher also contacted the Peugeot head office several times and unfortunately did not receive any response. The researcher also tried to talk with Peugeot's UK plant; they also refused to talk and advised him to contact the head office in France.

information to us. If you ask the Germans, the English, and the Italians, they are very good compared to the French and of course the Koreans and the Japanese are much better" (Interview 09A, p.5-6, paragraphs, 1-6).

Trust is a key factor that influences knowledge sharing (Renzl, 2008). McEvily *et al.,* (2003, p. 92-93) argued that, "trust makes decision making more efficient by simplifying the acquisition and interpretation of information and also guides action by suggesting the behaviour and routines that are most viable and beneficial under the assumption that the trusted counterpart will not exploit one's weakness".

Al-Abrrow *et al.,* (2013); Khanifar *et al.,* (2012); and, Rezaeian *et al.,* (2013) argued that among Iranian organisations the concept of trust has a significant impact on organisational performance; a low level of trust will cause a high level of pressure, a low level of efficiency and a lack of creativity among Iranian organisations. Mahdavi-fard *et al.,* (2013) said that trust is under the influence of the main culture of the community. The research outcomes show that trust among IJVs and IKCO is one of the important factors and they also suggest that a lack of trust together with the cultural differences among IKCO and the IJVs could negatively affect knowledge sharing behaviour.

This empirical study showed that the different levels of trust between IKCO and its two different partners (Peugeot and PAD) had two different outcomes for the knowledge sharing process. PAD, as a British partner, had a positive impact on knowledge sharing behaviour among IKCO members; on the other hand, French Peugeot did not have a good and positive feedback among IKCO members in terms of knowledge management process. Unfortunately, the French partner did not show any interest in participating in this academic research.

5.4.3. Political influence on the IJVs' behaviour with regard to knowledge sharing

Henisz and Delios (2002, p.340) suggested that the institutional environment includes "political institutions such as the national structure of policy making, regulation and adjudication, economic institutions, such as the structure of the national factor markets and the terms of access to international factors or production and socio-cultural institutions, such as information norms". Rondinelli and Behrman (2000) believed that the shape and influence of institutions will vary from country to country, and that this in turn will cause variations in the norm of 'acceptable' behaviour. Ferretti and Parmentola (2010) argued that in most developing countries government policies directly affect IJV relationships, and Abdolshah and Abdolshah (2011) believe that in Iran, the government has the key role in developing knowledge management processes.

In this study, within IKCO, political factors also affected the effectiveness of knowledge acquisition and knowledge sharing. It is important to mention that the current international political factors are directly linked to the issue of (a lack of) trust that was previously analysed. In the case of IKCO, political relations have meant that it has been restricted in its international cooperation. Other issues such as international sanctions have also affected various aspects of its business transactions, such as banking and logistics, according to the Deputy Director of the Strategy Department (Interview 30B, p.3, paragraph 1).

For example, the Design and Development of Engines Manager commented: *"If I want to classify the problems, I should say the first issue is the political problems. For example, IKCO is currently trying to work with a German Company, but they have a committee so they have to check whether or not they are allowed to work with us and they have to get immunity and permissions"* (Interview 27B, p.09, last paragraph).

Furthermore, the Deputy Director of the NPD Department said: '*the political condition of our country is very influential. At present, they (the French) will never transfer the tiniest piece of knowledge, expertise or technology to us. Now imagine, this situation changed and there were a stable situation where there was little enmity. The French would and will never help us by transferring their technical knowledge to us"* (Interview 1A, p.13, paragraph 4). He also mentioned that the French do not like to consider IKCO as a strategic partner; there was no mention of IKCO's name in the Peugeot 2009 annual report. *"Peugeot has given us its products and we are producing them in Iran and they make money here, but Peugeot does not believe that it has a strategic partner named IKCO. They believe that without having a strategic partner they can boost their interests"* (Interview 1A, p.14, paragraph 2).

As quoted in the previous paragraphs, it was difficult for IKCO to get inside Peugeot. IKCO had this problem with Peugeot and it had a hard time getting information (Interview 3A, p.10, last paragraph). The Adaption of Engine & Power Transmission Manager also highlighted that: *"the French partner is famous in the Europe for being proud and self-satisfied. For example, if we talk to an English or German person, they would more easily give the information with respect to the French. It's true about the French, they only see themselves and when it comes to giving information, they hardly do it. The French usually give us general information that one could find in every textbook on automotive making and there is no need to give it to us. They always give us a final product and a final product plan* [instead of presenting us with a step-by-step guide]" (Interview 6A, pp.4-5, paragraph 4 & 1&3).

In addition, the Adoption of Engine & Power Transmission Manager said: *"the 206 cooling system and the engine oil temperature were problematic and the automatic gears had issues. We emphasised this to the Peugeot and they fixed the issue but they did not let us in on the design process. They tested the parts and sent the result back and we had it produced here and we tested it again and we found that it still had a problem. Peugeot reviewed it again and we reached what we wanted after a number*

of trials and errors. But we were not involved in the design process. They just reported to us the tests they had done along with the diagrams and figures" (Interview 6A, p.9, paragraph 1).

The Adaption of Engine and Power Transmission Manager also reflected on the working relationship with Peugeot: "*our major partner is Peugeot and we have been working together for more than 15 years; the relationship between IKCO and Peugeot is not excellent one. Peugeot derives much profit from IKCO but they do not want our engineers to reach the level of Peugeot's technical knowledge. If the relationship between IKCO and the Peugeot was good, perhaps IKCO would perform much better than this, a relationship like Hyundai and Mitsubishi. These two have worked for about 15 years together. Now Hyundai is one of the titans in the world's automakers and we (IKCO) have not progressed with respect to Hyundai"* (Interview 28B, p.9, paragraphs 2-3).

After 20 years of working with Peugeot, IKCO was still unable to close the knowledge gap between Peugeot's experts and its Iranian experts working on the same joint project. This indicates that IKCO was unable to successfully transfer knowledge from Peugeot to IKCO. Although the 206SD was a successful product in IKCO, IKCO was unable to replicate its success with the 206SD jointly developed with Peugeot. As a result, IKCO was unable to develop another new product independently.

IKCO's connection with Peugeot was partly the result of international politics. The Deputy Director of the Strategy Department argued that having the French as a key partner had had both advantages and disadvantages for IKCO: "*if you go back 20-30 years ago, and just compare the situation, you will see that Iran was in the war and under sanctions. Peugeot was good at that time. But after that time, we were worried about the renewal of the policy. However, Peugeot is doing the same policy as 30-years ago and this is a negative point."* (Interview 9A, p.10, last paragraph).

The following background also shows that Peugeot have had issues in the past with other automakers too. For example, in the early 1980s, Peugeot was one of the few companies that entered the Chinese market. Due to conservatism and political reasons, and the problems that existed in the early 1990s, they drew back from China. About the same time, the Germans invested there and their Volkswagen remained there despite the vague conditions when it was not clear where China headed. Volkswagen went on to develop there as the Chinese market began to develop. The company made maximum profit and only later did the French try to go back there. It seems that their conservatism and commercial view have prevented Peugeot from establishing business in other parts of the world. The collected evidence shows that they do not take risks. In their relationship with Iran, their conservatism and commercial view has pre-dominated their strategic view. They have the market but they do not have a strategic view; they only look at it commercially and they do not take risks.

Recently, The Financial Times (March 2012) reported that: *"Peugeot the French carmaker that has more expatriate employees in Iran than any other western companies, is bringing the staff home until further notice"*. However, an official report by the Tehran Times (2012) shows that PSA Peugeot Citroen halted activity in Iran in February 2012 when economic sanctions against the Islamic Republic were decided upon by the US, EU and UN. The French car-making group has also stopped its exports of vehicles to Iran, which accounted for around 13 percent of the firm's global deliveries last year. Iran was PSA Peugeot Citroen's second-biggest market in 2011 in terms of trade volume. Based on the evidence above, it is clear that the French could easily change their strategies and policies based on their own interests and the international political circumstances, and they could easily ignore the agreements as Peugeot did in the early 1990s in China and later in Iran. The Planning & Future Strategy Senior Advisor stated that: *"in a recent study carried out in Europe on 300 individuals of which 7% were automakers and 3% suppliers of the*

automotive industry, they examined this issue in one of their questions to see how the conditions and sustainability of the automotive makers are in the view of the questioned group. Interestingly, the Germans were first, the Chinese second and the Indian third. If we look closely we will see none of our present partners are among these leading producers and have no place in the results of this study. This means that we have not selected the right partners that actually are more sustainable and stable in terms of their competitive position" (Interview 14A, p.4, paragraph 1).

Khabar Online (2012) the national news agency recently conducted an interview with IKCO's former Chief Executive Mr. Mantegi. They asked him about IKCO and Peugeot's relationship. Mr. Mantegi mentioned that in 2007 IKCO had aimed to increase the percentage of locally made auto parts for the Peugeot brands in Iran. Mantegi mentioned that after 20 years of trade and partnership under Peugeot license, IKCO had made a new agreement with Peugeot to replace a new platform with the existing 405 and Pars. Furthermore, the organisation had agreed to work on a new joint project 207-platform in Iran with 22 Million Euro capital (50%-50%) ownership and both companies had signed this agreement. However, Mantegi stated that after he left IKCO the organisation's policy changed and the agreement did not go ahead.

Interestingly, a few hours later, Khabar Online (2012A) conducted another interview, this time with IKCO's Spokesman. The Spokesman stated that there were no documents, information or evidence that showed that IKCO and Peugeot had signed the above-mentioned agreement. Spokesman has denied all above mentioned agreement This shows that sometimes domestic political changes can change an organisation's short and long term policies very easily. Peugeot would be a great choice in a time of war and sanctions; unfortunately in that situation they had an upper hand. No other country would take the risk or have the courage to work with Iran but the French did. They set an agreement and now they are selling their products to the Iranian market without paying much in the way of costs and without transferring knowledge. The 405 and Pars are 20-year old products and the 206 is a

10-year old product. IKCO has no power to change French interests and policies in the Iranian market. Peugeot is producing over 500,000 units of its old models in Iran via IKCO and most interestingly, whenever they feel like it they can stop the trade and change the agreement (as shown by the above-mentioned examples). Now it is clear that international / national political elements can influence and affect the process of knowledge management in organisations. International sanctions and a lack of competition between IJVs are two important elements that could have affected the relationship between Peugeot and IKCO. Peugeot is the main player in IKCO's production cycle. It controls the production cycle and it controls what knowledge can be transferred into IKCO's knowledge repository. It is possible that if IKCO had more than one strategic IJV partners and if the international-political factors around the country were steady, then there would be more possibilities of knowledge and technology transfer into IKCO's NPD process. In addition, the domestic political instability is another factor that could easily change the organisation's policy and cause the process of knowledge transfer fragmented. The research findings show that international and national political factors and economical factors play a very important role in the knowledge sharing activities in IKCO's new product development process. International political and economic sanctions and domestic political changes have effectively changed the organisation's performance dramatically.

5.5. Knowledge acquisition, retention and creation within the R&D Centre

"Knowledge of Research and development is created via a process by which information and know-how are shared and combined through various exchanges" (Henard |& McFadyen, 2006, p.41). As already discussed, R&D members are the knowledge-intensive and expert group in an organisation. Their knowledge and expertise is very important to new product development, and their ability is the major strength of a product development strategy (Henard & McFadyen, 2006). Referring to

the literature and reviewing different generations of NPD processes shows that the R&D centre can be seen as a hub that gathers all possible and useful knowledge from internal or external sources (this can be tacit or explicit knowledge). IKCO established its own R&D centre in 1997 and it employs 600 experts, engineers and administrators in its R&D Department. IKCO has had several joint projects with a number of international auto makers and international auto designer, including Germany, England, France, Japan, Korea and Taiwan. It jointly designed the domestic brand called the SAMAND under the Peugeot 405 platform and finally in 2001, the first generation of the SAMAND was introduced to the local and international market. From 2002 up until 2005, three different generations of SAMANDS were launched into the domestic and international markets. During the same period, IKCO and Peugeot worked closely on a joint project/product called the SD206, which was introduced to the market successfully in 2005. Among the interviewees at IKCO, the SD206 was widely recognised as a successful project. The interviewees mentioned that customer satisfaction with the SD206 was very high, and its quality was highly satisfactory. The SD206 was also recognised as a successful project because it was delivered to the market on time. IKCO invested money during the successful SD206 project and Iranian engineers were actively involved in its development and market launch. However, some of the key Iranian engineers left IKCO after the SD206 was successfully introduced to the market. Most recently, a report by the Head of the Trade and Industrial Committee at the Iranian Parliament showed that in the last 10 years over 1000 experts have left IKCO and 300 of these experts could have found jobs with other international automakers in Canada, the US, the EU and East Asian countries (Ghanoononline, 2012).

The interview data reveals that those Iranian engineers left IKCO primarily because they believed that IKCO could not reward them financially and there were not enough new activities to keep them satisfied. (The Internal Accessories Mechanism Manager mentioned that these experts were looking for new opportunities, new projects and

new challenges, and IKCO could not provide these opportunities and conditions (Interview 04A, p.9, paragraphs 3-4)

The problem of knowledge retention was repeatedly mentioned by both the key informant at PAD and IKCO's employees. According to the key informant at PAD: "*none of the engineers involved in the SAMAND project had any platform experience at the beginning of the project and those trained experts gained knowledge during their missions in the UK and back at the R&D centre in IKCO, and unfortunately these experts have left the R&D*" (Independent interview, p.9, paragraph5).

The Planning & Integration Class A/B Manager also highlighted that: "*a number of personnel were absorbed in the R&D and they were trained and gained experience during different activities. However IKCO could not keep them all and these staff gradually, one by one left the company. These people came to the R&D centre right after graduation and had academic and theoretical experience rather than practical and over the years these staff gained practical experience too and became a valuable asset for the organisation (tacit knowledge) and unfortunately the IKCO could not keep them inside the organisation*" (Interview 07A, p.14, paragraph 2). These are some of reasons why IKCO's R&D centre, which was built in collaboration with the British, could not successfully transfer the knowledge learned into developing a subsequent model. The above example indicates that the lack of recording of successes and failures in past projects in the organisational knowledge repository hindered future new product development.

For example, the Planning and Integration Class C/D Manager mentioned that the lack of recording of successes and failures could affect a project: "*in case of the projects that have problems in terms of time management [time to launch new products to market] we unfortunately do not have a clear specific system to record the reasons for delays. This is a problem everyone has in IKCO and it is very important. We specify a project to be done by next year in the line. After one year the*

manager changes/leaves and there is no record of his personal knowledge [knowledge of failure and success of the project] and the new manager would say that this is wrong and we have to stop" (Interview 3A, p.6, paragraphs 1-2).

This sentiment was echoed by other departments. For example, the Platform X90 Manager said: *"there is not such a clear system, a specific system to tell us how to store knowledge in IKCO, to tell us how to store and record knowledge of success and failure, so since it did not exist none could record and have access it"* (Interview 08A, p.6, paragraph 2). Similarly, the Market Planning Senior Advisor mentioned that: *"none is in charge of recording knowledge of success and failure; in fact our boss has all the information from the people who have been here in the past. Recording information in the present is mostly done individually. I am individually remembering my successes and failures, but it is not stored in a common place. There is no such clear system and it is not fully stored and recorded and nobody can have access to my file, since it is in our mind and not in a system"* (Interview 16A, p.9, paragraph 1).

The Deputy Director of the NPD Department also mentioned that recording knowledge of successes and failures within IKCO was problematic: *"we document the information but as there are no central record policies in IKCO, it is difficult to find it and in this case the organisation tends to take cost and buy the same knowledge that has been stored somewhere within the organisation. The organisation goes and buys the knowledge they had, maybe a little more advanced version. IKCO pays these costs and they have it no problem but in the private sector we cannot see this"* (Interview 01A, p.5, last paragraph).

The lack of knowledge recording meant that IKCO could not take its past experience forward and learn from it. Additionally, IKCO had to spend money and buy knowledge from outside. This coincides with Alavi and Leidner's (2001) comments that much of the knowledge an organisation needs exists inside the firm, but identifying what knowledge exists, and then recording, sharing and leveraging such

knowledge, remains problematic. The practice (or lack) of knowledge retention had a significant impact on IKCO's new product development process. This was evidenced in a number of examples within the NPD Department which failed to record its past successes and failures (especially in previous joint venture projects with foreign partners) and hence failed to transfer knowledge to domestic product development.

The state protected market and a lack of strong competition among the automakers in the Iranian auto market are other factors that have affected IKCO's R&D activities. Based on the Research and Markets report (2011), IKCO overtook its competitor SAIPA and took charge of over fifty percent of the Iranian auto market in 2011. The report showed that IKCO produced over 774,965 cars in 2010, an increase of 20% on the previous year and that it aimed to produce 850,000 vehicles by the end of 2011. This result is interesting for an organisation / country under international sanctions. The Iranian government has invested in the car industry with restrictions on foreign trade and high tariffs on imported vehicles, and the result is that domestic car buyers have little option other than to turn to Iranian manufacturers. Khalaj (2013, p.1) reported that, "car production in Iran has long been a political matter with central government taking a role in directing the operations of IKCO and SAIPA. Many commentators are now urging the government to bail out the industry and most recently the government has promised to pay $814m to the two leading carmakers IKCO and SAIPA". The Iranian auto industry has been subsidised by the government and is not operating in a truly competitive environment. The government's support has hidden financial weakness and operating inefficiencies and there remain serious concerns about consistent quality control. However, it is clear that locally built parts do not always meet the required standards and with the move towards vehicles built solely from Iranian parts, there is concern about the reliability of these vehicles once they out are on the road. BMI (2009, Q4, p.28) reported that, "quality control remains a major issue in the Iranian automotive sector as the Iranian Standard and Quality Control Company (ISQCC) raised widespread alarm about the level of faults in Iranian manufactured cars, when it found that models with a high level of locally

sourced content had a far higher number of faults than those assembled or made jointly. The SAMAND had over 300 faults per car on average while the Kia and RD had more than 500 faults'.

The immature intellectual property rights (IPR) in Iran are one of the factors that influence R&D activities. Iran has been a member of the WIPO since 2002, and has acceded to several WIPO intellectual property treaties; however, the country is not a signatory to the WIPO Copyright Treaty yet and this is affecting all innovative ideas and activities within the R&D Centre. For example, the Platform X90 Manager mentioned that: *" IKCO does not have its own standards and there is a chance that if we look at the SAMAND plans, we will see other automakers' standards"* (Interview 08A, p.5, paragraph 3).

The Technology Strategy Manager said: *"we receive benefit from other automakers by applying benchmarking and it is mainly Peugeot. There are also other automakers but we are trying to benchmark the automotive makers who are at our level in terms of the product class mainly those in classes C and D. However, IKCO does not benchmark the SAIPA for technologies because IKCO knows that the existing technologies inside Iran and domestic automakers are not comparable to IKCO's but in terms of quantity and product these local automakers should be monitored"* (Interviewee 12A, p.11, last paragraph). The Adaption of Engine & Power Transmission Manager said: *"we act based on a series of standards we have or have taken from somewhere else"* (Interview 06A, p.7, paragraph 3).

When the participants were asked about the importance of creating innovative ideas within the R&D centre, most answered that the stage of their knowledge and experience had not reached the level of thinking about creative ideas / projects; avoiding risk was very important and they usually tried to benefit from their international competitors' findings (i.e. by copying their findings). Deputy Director of the NPD Department says: *"there are several things that we have used for the first*

time in our products, but these were the things that the imported cars already had. However, among the producers in Iran the IKCO was the first to use those systems" (Interview 01A, p.8, paragraph 2).

The Planning & Control Senior Advisor said: *"We use and apply all sources of information in our job. For example, the SAIPA has been leading in providing sales methods with respect to IKCO. Our sales were mostly in the form of pre-selling and cash sales and then we introduced selling in installments; the SAIPA was leading in this method and so we got this idea from SAIPA. We Iranians do not normally take risks"* (Interview 14A, p.11, last paragraph).

The participants believed that the experts and skilled personnel were IKCO's most valuable assets and strength and that losing these knowledgeable personnel could be one of the major issues within the R&D department. The Head of SAPCO Testing & Research said: *"highly educated knowledgeable individuals need motivation to stay and these people need to be satisfied technically or financially which is not permitted here in IKCO and I think this is exactly IKCO's problem. Our experts are encouraged to go and work in UAE with a salary 3 times more than their salary in Iran, with many facilities, accommodation, car and many other facilities"* (Interview 36B, p.14, paragraph 1).

The Materials Research Centre Manager argued that: *"the individuals who have worked during the past 15-20 years in IKCO are the most valuable assets and these valuable people possess knowledge and experience and they are the capital of IKCO and generally Iran's automotive industry"* (Interview 34B, p.17, paragraph 1). In addition, the Technology Strategy Manager said: *"we are losing engineering and research personnel and one reason is that the new projects should be specified. As long as there was the SAMAND project these experts had a job to do, but now there is no new project and they want IKCO to have innovative projects and when there is no project the experts and engineers leave for a better job and position. To keep these*

people we have to introduce good development projects in IKCO" (Interview 34B, p.14, last paragraph).

The Market Strategy Manager said: *"how to keep and encourage them falls in the field of HR. First of all the organisation must be dynamic and continuously introduce new projects. It should also pay more attention to HR issues. The selection of higher-rank managers and engineers needs motivation such as intellectual and material support"* (Interview 33B, p.17, paragraph 3).

The Planning and Integration Class A/B Manager said: *"every department has its own experts. For example, we have product engineers, who have high value for us here in this department. We cannot stop these people from leaving since IKCO does not pay for its human resources and the organisation considers both the top level and lower ranks the same"* (Interview 29B, p.12, paragraph1).

The Adaption of Engines and Power Transmission Manager said; *"if I am satisfied financially and have a mind free of distractions, I will stay here at IKCO. I will focus on my job. If I am worried about my life costs then what I am doing will be inefficient. IKCO should care about the personnel's needs, their families and try to secure these, then the personnel will concentrate on their jobs"* (Interview 28B, p.12, paragraph 1). Based on the participants' answers and reports presented by the Iranian parliament, it is obvious that IKCO has no mechanism whatsoever to keep its key personnel. The Design and Development of Engines Manager said: *"the HR system does not know its personnel. For example; I am a first-rank or second-rank expert. There might be another person besides me who is also an expert of the same rank. Take further that he is so active and hard-working so if he takes a day off, the whole production line will be interrupted. But my presence in IKCO has practically no influence and I say spend my working hours doing my personal affairs. IKCO consider both of us the same. We are both first-rank experts in their view"* (Interview 27B, p.20, paragraph1).

The participants mentioned that there were two possible methods of keeping personnel at IKCO. One of them was to motivate personnel; the majority of the people did not care as much about material needs as they did about motivation. The Deputy Director of the NPD Department said: *"I know people here in IKCO who do not care about money and only try to satisfy themselves by doing good jobs and being effective. The other method is financial. A person who works here must have lifelong security and can meet his needs and these are two aspects of the problem. We do not have a goal. Thus we ask the personnel to do a job, but what at the end? One asks, I do the job and finally the project will stop or will be assigned to someone else. I know there is a career path in foreign countries and goal setting and policy making are based on the path. Every individual knows his / her path in an organisation. In IKCO we do not have such a path and many people are in a state of uncertainty"* (Interview 23B, p.20, paragraph 1).

The question here is, if IKCO were private, how would it be different? The Materials Research Centre Manager believed that *"a huge corporation like IKCO with the present situation could not exist as a private company as it could not afford itself. The reason is that political problems as well as policy making in Iran are such that a large company such as IKCO cannot make decisions easily"* (Interview 35B, p.16, last paragraph).

However, the Technology Strategy Manager said: *"if IKCO was private it would definitely have higher productivity. At the current productivity level we cannot compete. When we mention private then it means IKCO should act competitively. We could compete with our 206 with Hyundai, KIA and other products out there in the market. We should improve our productivity, which is one of our major issues. If IKCO was private we could be less affected by government policies. For example, a great number of our investments are affected by these policies and these could be reduced. Perhaps losing our personnel would be much less. Due to the fact that*

IKCO is not private we are losing many of our experts" (Interview 35B, p.14, paragraph.1).

The Market Strategy Manager said: *"perhaps many decisions that IKCO made and gave them up in the middle and started something new would be eliminated"* (interview 33B, p.17, last paragraph). Based on the participants' views, it would have advantage and disadvantages. If IKCO was private, it could take advantage of financial and technical support and it would be smaller.

The IKCO & Peugeot Relationship Manager argued that: *"Private organizations usually try to work with the smallest number of personnel. IKCO is a company that in addition to the mission it has in the industry, it also has a responsibility in creating employment and this is one reason why it is a huge corporation. Thus if it was private it would have both advantages and disadvantages. If IKCO was private this could become a problematic aspect that it could not establish desirable relations as foreign companies might not be willing to work with small companies. The other aspect is that, being private could cause the processes to run faster"* (Interview 32B, p.6, paragraph 2).

The Relationship between IKCO and Peugeot Senior Advisor said: *"one of the most important issues is the financial aspect; when we mention the word private the interests and profit will become a priority. However, when IKCO is not private, then the profit will be a lower priority. Instead, other goals, particularly political ones will be of higher priority, since they are more related to government. After all, although financial goals are important to the government, other goals are a priority to them such as political and social ones. In a private company on the contrary, you have to watch the money you spend and look after your personnel that will bring you more profit"* (Interview 31B, p.6, paragraph 2). If IKCO was private it would be much more productive, it would work in a goal-oriented manner and it would be more motivating. There is a big difference between cleaning your own car and cleaning

somebody else's car. In this case, if IKCO was private, the personnel would feel a sense of owning the product. As already mentioned, there are several parallel systems duplicating each other and this is a big problem for IKCO at the present time. If it was private it would not work like this. There are jobs within the organisation that are duplicated in other departments and these jobs might not be necessary at all. The high number of personnel is a problem in itself.

The Planning and Integration Class A/B Manager said: "*there are a number of departments in IKCO which are not necessary. We currently have several engineering departments in IKCO, SAPCO, R&D and most of them are working in parallel and duplicating each other's tasks. The quality department does not have any division as engineering but it also carries out engineering practices*" (Interview number 29B, p.14, paragraph.1).

The participants believed that the first thing that is usually paramount to a private sector company is loss and gain and trying to keep it positive. Also, the management of a private company attempts to take full advantage of the organisation's capacities to enable it to maximize its revenues. It was believed that if IKCO was privately run, it would not bear many of the costs it does now. It might establish a stronger link to a partner to create a more varied product basket out of its production capacity. It would not be constrained to its existing products and therefore it could expand its markets, and thus its profit. Another important point is that at present there are several parallel departments in IKCO; these would not exist if IKCO was a private company.

The Planning and Integration Class C/D Manager said: "t*he evaluation would be better if IKCO was private and would be better in terms of quality. Being a private company will improve competitiveness and IKCO would act better in development*" (Interview 25B, p.6, paragraph1).

Johne and Snelson (1988) believed that product development is an important key factor for the future of organisations, and based on Ansoff's matrix a new product development strategy can be seen to be one of the main elements in an organisation's growth. In the literature review the development of the NPD process has been reviewed and the findings show that the actual development of a new product is the process of transforming a new idea into a new product or a new service. The literature review showed that scholars such as Saren (1984); Baker and McTavish (1976); Jong *et al.,* (2007); and Tidd *et al.,* (2006) identified different models of new product development processes to explain and show the best way to achieve successful new product development.

In addition, Hart and Baker (1994) argued that in order to be successful in the new product development process, a firm should simultaneously meet two important aims: firstly, maximizing the fit with customers' needs; and secondly, minimizing the time to market. Scholars are always exploring and challenging different knowledge management concepts to achieve these two important aims. NPD models talk about how to create, gain, record and share knowledge among departments, staff and organisations smoothly and effectively, and how to deliver it (new knowledge) to the final successful product or service.

Models such as the department-stage model, the activity-stage model, the decision-stage model all aim to introduce the best NPD process model with a higher degree of performance. The research findings show that IKCO's NPD process can be recognised as an early developed NPD model the called Activity-stage model (See 3.3.1.2). The research findings show that IKCO's NPD process is broken down into a number of activities; each department carries out a specific task and passes the result the next department. In this model the departments specify the task needing to be conducted. However, the tasks are performed sequentially, which causes a long development time, communication problems among members and departments, and increased costs (Clark & Fujimoto, 1991).

The R&D centre can be seen as a hub that gathers all useful knowledge (both tacit and explicit) from internal and external sources in an effort to facilitate its new product development process. In this study, the explicit and tacit knowledge sharing was explored in the first two themes. Knowledge sharing through the knowledge repository mainly focused on issues around explicit knowledge sharing and knowledge sharing through interaction and socialisation mainly focused on issues around tacit knowledge sharing.

However, it is important to mention that all of the factors (sub-themes) in these two early themes influence each other. The research findings show that there are knowledge sharing barriers in the context of IKCO's R&D projects. IKCO, as an important organisation in Iran, is facing a variety of difficulties in its R&D projects: it is not able to keep its tacit knowledge (know-how) within the NPD Department; there is no clear strategy to record knowledge of successes and failures; there are issues around information technology; there is neither a clear strategy nor any guidelines regarding reward and motivation systems; and there are issues around top management support.

The research findings confirm that, "there are always knowledge-sharing barriers in the context of R&D projects. Knowledge-sharing barriers in such contexts include codification, inadequate IT to support knowledge-sharing, a lack of initiative and strategy by the workers, a lack of time and suitable resources, communication barriers, and the interdependence of knowledge and skills between partners and participants". (Santos *et al.,* 2012, p.27)

CHAPTER SIX: DISCUSSION

Based on the semi-structured interviews, company documents and published data (data triangulation) this study identified four key analytical themes that helped the researcher understand knowledge-sharing within the new product development process in IKCO. The research findings confirmed that although theory on knowledge sharing developed in the West is applicable to the Iranian context to some extent, knowledge-sharing and knowledge-transfer processes are considerably influenced by the idiosyncratic organisational context, which in turn is significantly influenced by the wider context, such as the political regime, industry dynamics, technological development and institutional framework. The research findings are categorised into four main research themes. These four main themes are identified based on the methods that have been already discussed in the methodology chapter. The research themes are:

1. Knowledge-sharing through the knowledge repository
2. Knowledge-sharing through interaction and socialisation
3. Knowledge-sharing with international joint venture partners
4. Knowledge acquisition, retention and creation within the R&D

Knowledge-sharing through the knowledge repository has mainly focused on explicit knowledge sharing within the organisation and has explored different factors that affect the process. The second theme, knowledge-sharing through interaction and socialisation, generally focused on tacit knowledge sharing within the organisation and identified elements that play a central role within the process. The third theme, knowledge- sharing from international partners mainly focused on IKCO's IJV partners and explored the facts that influence the process of knowledge-sharing between IJVs and the organisation. Finally, the fourth theme explored knowledge acquisition, retention and creation between IKCO's R&D and other departments and

identified a number of factors that influence knowledge management elements (acquisition, retention, creation and sharing).

A number of factors that also impact the aforementioned themes are categorised in Figure 14.
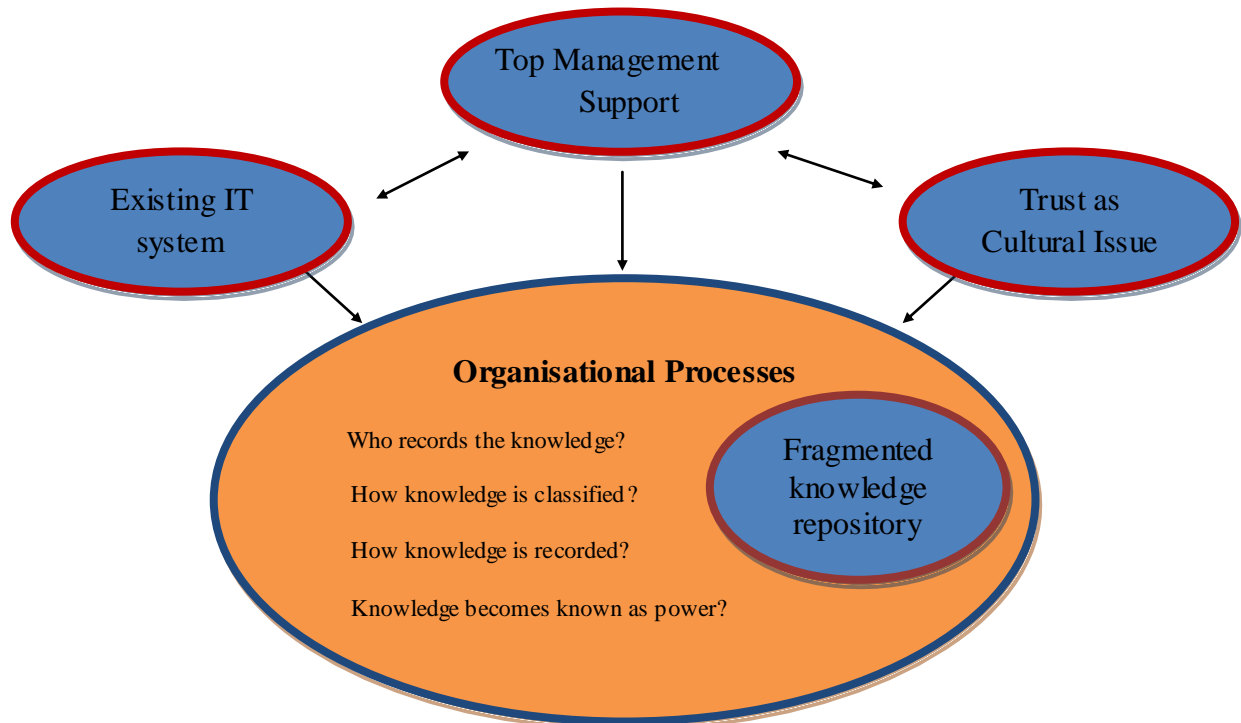
Figure 14: Factors affecting the research theme

Evidence gathered through this research shows that, within IKCO, there is valuable knowledge such as documents, reports, CADs, maps and expertise in different forms, i.e. hard or soft formats. However, the evidence shows that IKCO does not benefit from these valuable assets. In other words, a number of factors impacting the knowledge repository fragmentation were identified. The fragmented knowledge repository was controlled and affected by several elements shown in Figure 14.

Firstly, the researcher reviewed some of the definitions of knowledge repository. Wang (1999) believed that knowledge repository is often used as a parallel terminology to organisational memory. Other scholars such as Walsh and Ungson (1991) argued that organisational memory is knowledge learned from past organisational experience, which can influence present decisions. In this study, the knowledge repository is defined as an organisational information management system, often centralised in the organisation or in a department, which captures, organises and stores knowledge. Therefore, the knowledge repository allows for the retrieval of knowledge to support specific tasks within the department or the organisation. In other words, the analytical theme "knowledge sharing through a knowledge repository" concerns sharing codified knowledge through a centralised knowledge repository in IKCO. Based on the participants' answers and other supporting documents, three elements (sub-themes) effectively influence IKCO's knowledge repository, as follows:

1. **Knowledge sharing through the knowledge repository (1st theme)**

Mudambi and Navarra (2004) and Bacon (2011) believed that having valuable and exclusive knowledge provides authority to the knowledge holders and can be used as a great tool within the establishment when there is a need for negotiation within or between organisations. The research findings supported the argument on the importance of knowledge for organisations and individuals within IKCO. The research findings confirmed that having exclusive knowledge within IKCO provided authority to the knowledge holders. The majority of IKCO's staff believed that using their knowledge was an important factor when the organisation or other colleagues needed their knowledge. This exclusive knowledge is used as a tool for bargaining and negotiation within and between departments and organisations. The research findings show that the majority of the participants believed that once the holder of the knowledge (tacit or explicit) shares and stores their knowledge, and then he/she loses power. The instability of the organisation shifts the balance of bargaining power and

without this power the participants believed that it is impossible for one to survive. In addition, the research findings show that the hierarchy within IKCO caused information limitations; now, if a member has more information and knowledge, this means that he/she holds more power and this is one of the main reasons that the knowledge holders try to keep their valuable tacit or explicit knowledge and not store and share it in a common place. The research findings also show that the organisation did not have clear guidelines or regulations that could encourage the personnel to avoid such behaviour. The research findings in the sub-theme "effectiveness of information technology" show that information technology can be seen as one of the main factors that causes knowledge repository fragmentation in IKCO. The role of information and communication technology in knowledge management is widely recognised.

In terms of IT and knowledge sharing within the organisation, Davenport *et al.,* (1998); Gourlay (2001); Borghoff and Pareschi (1997) and Davenport and Prusak (1998) argued that information technology enables better knowledge management activities, and that information technology, such as the Internet, Intranet and e-mail can be used, not only for the storage of explicit knowledge in databases but also as communication devices to exchange experience and knowledge with others (Egbu & Botterill, 2002). However, the research findings show that information technology has a limited role in knowledge management in selected Iranian firms and this may be due to the lower level of IT deployment in Iran. Akhaven and Jafari (2008) argued that firms in Iran look at IT as tool for facilitating some of their work and processes and not as an important enabler for knowledge management and learning. It is important to highlight that Hardaker (1998) argued that there is a need to invest in information technology. Akhavan and Jafari, (2008); Farhanghi *et al.,* (2013); Valaei and Aziz, (2012), Albadvi (1999) and Gerami, (2010), all believed that information technology has a limited role in the knowledge management process in Iranian organisation. The research findings confirm that information technology in IKCO has not been fully developed yet and IKCO's members are having difficulties when using their IT system.

Within IKCO, information technology is widely recognised as important; however, it is insufficient in terms of facilitating the process of knowledge acquisition, organisation and storage, as revealed in the interview findings. The research findings show that there are overlapping results in different sub-themes. For example, the findings show that there are issues around recording the knowledge of success and failure in IKCO's knowledge repository (via information technology). IKCO did not have clear guidelines to show departments how to use information technology effectively to record knowledge of success and failure, and every department and individual acted independently. Within IKCO, there was a great deal of concern about the effectiveness, flexibility and quality of IKCO's information technology (called the Information System) due to multiple issues embedded within IKCO. Issues such as data security and data protection overshadowed the functionality, flexibility and effectiveness of the Information System. IKCO's Data Protection & Security Department believed that most of the available information, data and technologies within the organisation should be kept secret and protected. This policy also created access restrictions for personnel in different departments and different levels of the organisational levels. Ironically, information that was widely publicised in other countries, such as the company's annual reports, HR reports and financial reports, was considered as confidential material in IKCO.

The ineffectiveness of IKCO's Information System was also due to a lack of understanding of departmental needs for Information Technology. Data classification had become a major problem since the organisation believed that every single piece of data/knowledge and every document was highly confidential material. The participants believed that it was safer if they kept their knowledge /data/ information out of the common place to avoid the risk of sharing and storing confidential elements of it. The lack of clear guidelines on how the system could be used to record and classify data was another important issue hindering the effectiveness of the Information System. For example, the interviewees highlighted that the use of different formats for saving knowledge in the shared drive (repository) caused a great deal of difficulty and

frustration when individuals searched for information. There were no clear guidelines on how the data should be labelled and codified or on an appropriate filing method. Every department stored its valuable knowledge independently within the central Information System, or as hard copies in its own internal knowledge repository. In addition, the evidence shows that, within departments, there was no specific function to trace the activities and write about the problems faced along the way in different situations, and their solutions. The candidates mentioned that this information (knowledge of success and failure) was usually available in reports and the best person to consult was the project manager. However, IKCO does not have clear central regulations on this matter with regard to how everything should be written up, from initiation up to the end of the project.

The lack of a clear guidelines caused great difficulty in the categorisation and retrieval of information and knowledge stored in the Information System. The lack of knowledge categorisation or an effective knowledge directory caused by the lack of clear knowledge-sharing guidelines was echoed in different departments and at different levels of the organisation. The issues surrounding regulations and rules related to the storing of knowledge of success and failure within the IKCO were obvious, and every department stored its knowledge in different ways; however, the main concern was centred on having clear central regulations and rules that could be provided by IKCO's decision makers. Every department recorded its knowledge; however, there were no central recording policies across IKCO as a whole. Thus, it was difficult to find knowledge and the organisation tended to bear costs due to buying knowledge that was in fact stored somewhere within it. Alavi and Leidner (2001) argued that much of the knowledge an organisation needs can be found within the organisation but the main issue is that the organisation may not be able to identify that existing knowledge. For example, one participant mentioned a locker in the Strategy Department that contained over seven years of stored data (hard copy); however, the issue was how to find a single page of data within this massive knowledge store.

Lyles and Salk (2007); Sweeney and Hardaker (1994) and Marisa and Yusof (2011) argued that top management support is recognised as important for knowledge management and this is especially the case in organisations where the management team takes a more active and direct role in the business activities and decision making. Abdolshah and Abdolshah (2011) showed that knowledge management in Iranian organisations is a new subject and Iranian organisations top management support and commitment plays a very important role in knowledge management adoption and the learning process. As Bidmeshgipour *et al.*, (2012) mentioned that top managers can provide better opportunities to their employees to have better training, and to generate fresh and new ideas and launch new services into their organisations. The findings of this research show that in IKCO decisions are centralised and then disseminated from the top to the bottom. The research identified two key roles of the top management in the lack of effectiveness of the knowledge repository: firstly, in encouraging individuals to contribute to the knowledge repository; and secondly, in developing guidelines for the use of the knowledge repository. It was clear that top management support was mainly associated with the organisational culture and information technology. The research findings show that IKCO's top management did not do enough to support the development of an effective knowledge repository and top management support was perceived as increasingly negative since the introduction of a more hierarchical structure since 2000. The findings show that, within IKCO, there was no common or mutual method of motivation, nor was there an encouragement and reward system. However, middle managers tried to introduce their own mechanisms for knowledge-sharing. There was no clear evidence of the effectiveness of these mechanisms. The lack of top management support caused the fragmentation of departmental practices. The role of top and middle management in the development and implementation of guidelines for knowledge-sharing through the repository was another key aspect. The evidence collected shows that the lack of top management support had caused the fragmentation of the Information System. Top management support in developing and implementing knowledge-sharing guidelines was clear in IKCO. However, there

was fragmented departmental effort in knowledge-sharing through contributing to the knowledge repository. There was not enough evidence of the efficiency and effectiveness of such departmental efforts. The more hierarchical structure in IKCO had caused fragmentation of the staff's motivation and encouragement processes within the departments. This research also found that the lack of trust between members and managers could be seen as one of key elements that affected staff motivation and encouragement when the organisation aimed to share, transfer and record new knowledge.

2. Knowledge sharing through interaction and socialisation (2nd theme)

There are a number of elements such as cultural, technological and organisational factors that affect the knowledge sharing process within and between organisations (Mudambi & Navarra, 2004). Factors such as a lack of trust among members (Foos *et al.,* 2006), a lack of experience on the recipient's side (Szulanski, 2003), and the role of individuals (Smith *et al.*, 2007; Nonaka & Takeuchi, 1995; Bock *et al.*, 2005) play a very important role in tacit knowledge sharing among organisations. Yet, within an organisation there are always knowledge sharing barriers among R&D projects. These barriers include codification, information technology support, a lack of motivation among members, a lack of time and suitable resources, and communication issues (Santos *et al.,* 2012). The second analytical theme is the constrained manner of knowledge sharing through interaction and socialisation within IKCO. Sharing knowledge at IKCO appeared to be conducted primarily via codification; the knowledge was embedded within materials (reports, plans). In contrast, the sharing of knowledge through the transfer of experience and the establishment of shared contexts such as through face-to-face interactions appeared secondary to the generation of information. Furthermore, IKCO appeared to actively hinder the sharing of knowledge through socialisation. In this section, a number of factors deriving from the interviews that impact on knowledge sharing through interaction and socialisation inside the company are discussed.

One of the findings centres on conflicts between departments that appeared to hinder knowledge-sharing within the organisation. One source of this conflict was job duplication across departments. This suggests that job duplication has become a problem for IKCO. The importance and impact of family and friends' relationships in creating and sustaining job roles in Iran was further supported by the independent interviewee. This awareness of job duplication within the company not only makes IKCO cumbersome as an organisation and introduces a level of competition between departments, but also generates distrust between individuals. This also constrains the willingness with which individuals are prepared to share their knowledge with other members. One reason for this inhibition of individuals is job security, engendered by role duplication. It is important to mention that job security within IKCO is related to maintaining a person's position within the hierarchy rather than losing his/her occupation. Job duplication and the consequent growth in personnel within IKCO had induced difficulties in terms of effective management. One sign of this was the formal restructuring that took place in 2000. This introduced a new layer of hierarchy that created additional managerial positions and ushered in a more formal planning approach. Interaction between the departments appeared to be formally structured and process based, with the roles strictly delineated. It is important to highlight that the participants emphasised activities in which information was passed on rather than the active sharing of knowledge. In other words, there was an emphasis on the explicit and codifiable, particularly through reports, rather than the sharing of tacit knowledge. We cannot say that interaction between departments was always strictly regimented. Sometimes, face-to-face interaction took place, typically in response to problem-solving. The adoption of greater hierarchy by IKCO had also impacted on the transfer of knowledge within the company due to the unwillingness of senior managers to encourage and support the transfer of expertise and know-how. Just as individuals lower down the hierarchy were fearful of losing their position, senior managers were similarly concerned.

Another contributory factor inhibiting interaction and knowledge sharing within the company was the lack of a central clearly defined reward strategy that promoted the sharing of tacit experiences. This left the rewarding of individual contributions to a more ad hoc, localised approach, dependent upon the interests and whims of individual departmental managers. Lacking centralised direction, some managers had developed their own ways of encouraging knowledge-sharing. This important theme has explored the levels of knowledge-sharing in IKCO through interaction and socialisation using the interviews conducted in the field. From the departmental managerial point of view, the organisation did not encourage such knowledge-sharing, although exceptionally some middle managers had attempted, by example, to establish shared contexts and accordingly to generate trust. Hierarchy and job duplication within IKCO caused distrust between individuals who feared for the sustainability of their positions within the company and thus attempted to keep hold of their knowledge and expertise. The sharing of personally held knowledge did not lead to reciprocity, but rather position insecurity. To paraphrase Nonaka & Takeuchi (1995), IKCO did not systematically establish a field of interaction through which individuals could share their expertise and mental models. The research findings show that within IKCO, a lack of top management support, job duplication, the impact of family ties, the organisational hierarchy, job security, growth in personnel and the lack of a central clearly defined reward and motivation strategy, all negatively affected knowledge sharing through interaction and socialisation.

3. Knowledge-sharing with international joint venture partners (3rd theme)

The third analytical theme delineates knowledge-sharing with international joint venture partners. The international joint venture business strategy is a common type of entry method into a foreign market. This method gives quick access with low risk. Chrysostome *et al.* (2013, p.88) stated that, "joint ventures permit acquisition of new know-how and consequently present a good setting for the development of strategic competencies". However, Beamish (1988) highlighted that sometimes, the expected

learning may not take place, and the partnership between the joint venture partners may result in conflicts relating to power, cultural difference and personal interests. The interview data revealed several key factors that influenced IKCO's experience of working with its two key international partners, and hence its experience of knowledge sharing and transfer. Below, three key factors influencing IKCO's experience are discussed: the cultural distance between IKCO and its international partners; the issue of trust in knowledge sharing; and the political factors that influenced its international collaboration. The research findings show that IKCO has been learning from its different business partners since 1962. However, a number of factors have affected this learning process. Cultural differences are known to influence the way people in different nations or different organisations work. The evidence collected shows that Iranians preferred a structured approach to knowledge acquisition that involves a high level of knowledge codification. In some ways, this also reflects the fact that tacit knowledge is hard to transfer, as Nonaka & Takeuchi (1995) believed. Effective tacit knowledge-sharing or explicit knowledge-sharing requires a different mechanism. For example, tacit knowledge is more easily transferred through interaction and socialisation, whilst, explicit or codified knowledge can be shared and transferred through a knowledge repository, as discussed earlier. The research findings show that the concept of trust was acknowledged as one of the key factors that could facilitate or hinder the intra-organisational and inter-organisational processes—especially when knowledge-sharing was concerned. In this case study, trust emerged as a key issue between IKCO and its international joint venture partners. A lack of trust was easily identified as an issue when neither IKCO personnel nor their IJV partner wanted to share and store their own knowledge with their colleagues or business partners. The IKCO staff and their IJV partners did not fully trust each other and they did not want (fully) to store their knowledge and share it with their colleagues. This issue could be seen easily in the examples of the successful SD206 and the failure of their domestic product. Having a low level of trust between members and IJVs can affect the process of storing knowledge effectively. In addition, the issue of trust can be seen more

clearly and is obvious when knowledge becomes known as power between the members and the IJVs. It is clear that if you do not trust your partner/colleagues, you will not feel able to share your interests with them. Political factors were another important element that directly and indirectly affected knowledge acquisition and knowledge-transfer among the IJVs. Specifically, in the case of Iran, current international and domestic political factors are directly linked to the issue of (a lack of) trust, highlighted previously. In the case of IKCO, Iran's political relations meant that IKCO was restricted in its international cooperation. Issues such as international sanctions, banking, finance and logistics limitations, all affected knowledge acquisition and knowledge-sharing. According to the participants' responses, it was clear that these political factors prevented the organisation from choosing the best possible IJV partners and that the IJV partners had the upper hand in many projects.

In this study, within IKCO, political factors also affected the effectiveness of knowledge acquisition and knowledge sharing. The research findings show that international and national political and economic factors have played a very important role in the knowledge sharing activities in IKCO's new product development process. International political and economic sanctions and domestic political changes have effectively changed the organisation's performance dramatically.

4. Knowledge acquisition, retention and creation within the R&D Department (4th theme)

The research findings show that as Henard & McFadyen (2006) argued, within IKCO's R&D department, knowledge is created when information and know-how are shared and combined through a number of exchanges. The research findings show that IKCO's NPD process can be recognised as an early developed NPD model called the activity-stage model. The research findings show that IKCO's NPD process is broken down into a number of activities; each department carries out a specific task and passes the result on to the next department. In this model the departments specify the task needing to be conducted. The research findings show that within the R&D

department the majority of issues that have already been discussed are noticeable. As the researcher has already argued, the R&D department is a hub that gathers all possible knowledge and all related matters (matters related to knowledge). In addition, a number of new findings are also highlighted in the 4th theme; for example, the research findings indicate that the lack of recording of successes and failures in past projects in the organisational knowledge repository have hindered future new product development. The research findings show that IKCO could not keep its know-how, knowledge and expertise and that knowledgeable staff could easily leave the R&D department. The organisation could not effectively motivate and encourage its members to create, share and store knowledge. The research findings also show that the lack of financial reward within the organisation can be seen as one of the reasons for members leaving the organisation. The research findings also show that there are knowledge sharing barriers in the context of IKCO's R&D projects. IKCO, as an important organisation in Iran, is facing a variety of difficulties in its R&D projects: it is not able to keep its tacit knowledge (know-how) within the NPD Department; there is no clear strategy to record knowledge of successes and failures; there are issues around information technology; there is neither a clear strategy nor any guidelines regarding reward and motivation systems; and there are issues around top management support. The research findings confirm that, "there are always knowledge-sharing barriers in the context of R&D projects. Knowledge-sharing barriers in such contexts include codification, inadequate IT to support knowledge-sharing, a lack of initiative and strategy by the workers, a lack of time and suitable resources, communication barriers, and the interdependence of knowledge and skills between partners and participants". (Santos *et al.,* 2012, p.27). Figure 15 shows the final research framework after the discussion.

6.1 The Research Framework after Discussion

Knowledge management in the NPD process

Macro Environment:
Political regimes/stability, legal issues (especially intellectual property rights), supply and demand, industry dynamism, technological, institutional framework

Organisational Contexts:
Top management support/management control, organisational structure, organisational culture, information technology, organisational culture, and organisational policies

Knowledge-sharing through knowledge repository in R&D department (explicit knowledge)

Inter-organisational Knowledge acquisition (With international partners)

Knowledge creation process

Knowledge-sharing between R&D department & other departments

Vertical Knowledge-sharing along R&D reporting line

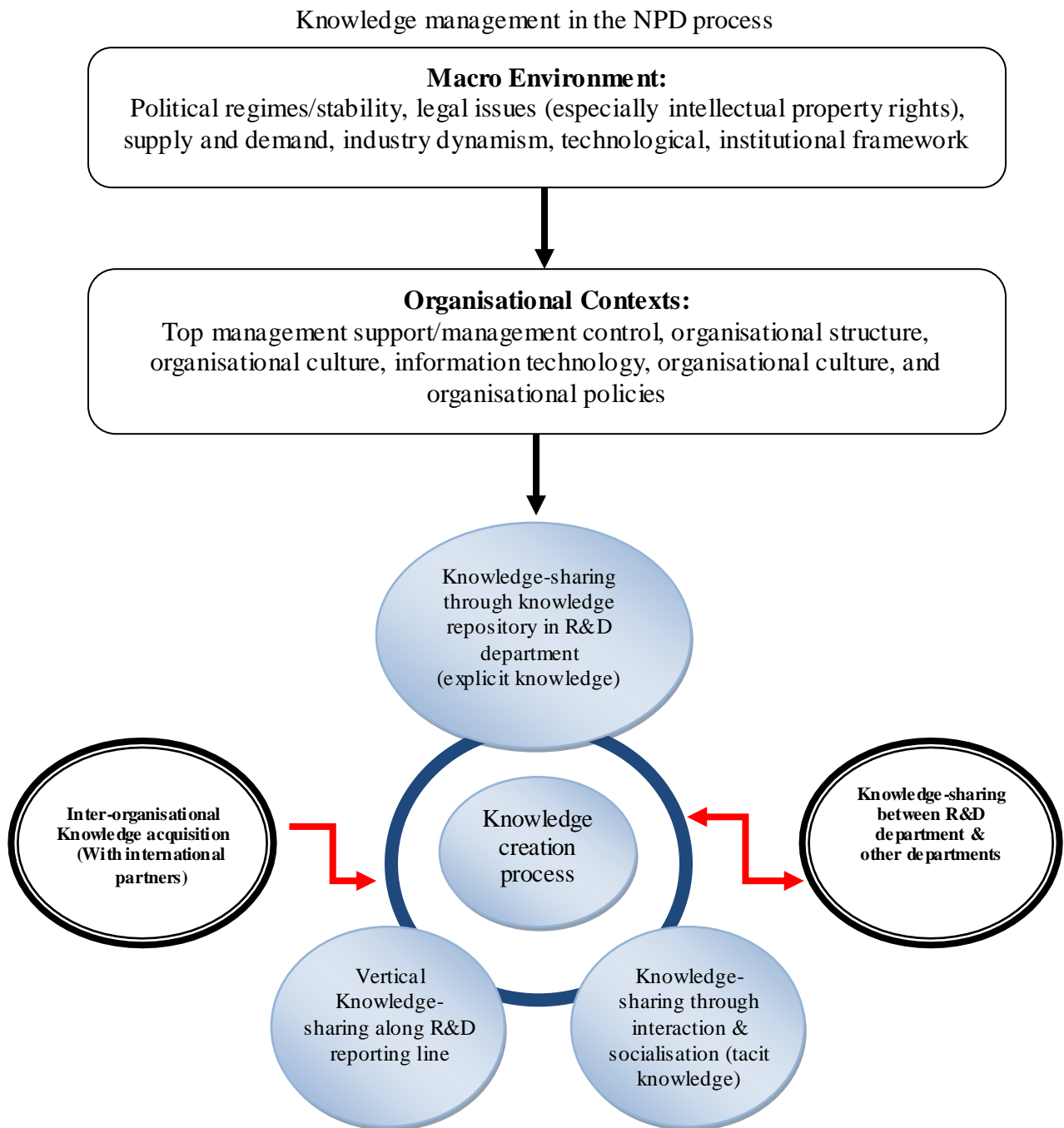Knowledge-sharing through interaction & socialisation (tacit knowledge)

Figure 15: The research frame work after discussion

This study aimed to investigate issues on knowledge-sharing in the new product development process in a single embedded case study (IKCO) in particular. This research investigated the way in which Western theory on knowledge-sharing and transfer can be applied, refined or developed in the Iranian context. It is important to mention that the "terms knowledge- transfer and knowledge- sharing are sometimes used synonymously or have overlapping content" (Paulin & Suneson, 2012, p.1).

Jonsson (2008, p.39) argued that, "within the frame of reference both knowledge sharing and knowledge transfer are used and discussed interchangeably". In addition, it is better to recall the definition of knowledge-sharing and knowledge-transfer first and then move on to the research framework (Figure 15). "Knowledge-sharing refers to the provision of task information and know-how to help firms and individuals to work together and collaborate with others to solve issues, develop new ideas or implement policies or procedures. Knowledge-sharing can occur via written correspondence or face-to-face communications through networking with other experts" (Wang & Noe, 2010, p.117). In the knowledge-sharing concept both parties benefit from each other's knowledge.

Furthermore, knowledge-transfer has typically been used to describe the movement of knowledge between different units, divisions or organisations (Szulanski *et al.*, 2004) and they may or may not benefit from their joint business. As already stated, IJVs have become a widespread type of entry into foreign markets. IJVs are a way for overseas organisations to enter new markets faster with lower risks. On the other hand learning in the host organisation has always been recognised as one of the main motivations of IJV establishment (Lane *et al.*, 2001). It is clear that both IJV partners will benefit from the collaboration. One side will enter the market with lower risk and will benefit from the business generated, and the other side (home/recipient) will benefit from their international partner's experience and knowledge and try to develop and improve their own or the shared business. The research framework (Figure 9) is drawn based on the research literature review and Western theories

around the research interest. In figure 9, Knowledge-sharing between organisations (IJVs) and individuals is shown as double sided arrows (⟷).These double sided arrows show that both parties are benefiting from their joint business by sharing knowledge mutually. However, in the final research framework (Figure 15) the knowledge-sharing concept between the IJVs, individuals and departments is not steady and, based on macro and micro factors, the knowledge-sharing concept is affected and becomes known as knowledge-transfer (↳). In the final research framework within IKCO, one side may benefit from the joint business and the other side may not; the result is that knowledge-sharing activity can be transformed into knowledge-transfer activity.

CHAPTER SEVEN: CONCLUSION

The first chapter (introduction) provided an overview of the thesis and the importance of the research. As a piece of research involving a single case study, it was important to have a clear view of the research context. Chapter Two reviewed the auto industry locally and internationally and highlighted the strengths and issues within the Iranian automotive industry, and particularly in IKCO. It was important to review this unique industry and identify its issues, strengths and weaknesses. It has been mentioned that the automotive industry is one of the fastest growing industries within the global economy and, based on this view, the Iranian government has highlighted the Iranian auto industry as one of the key industries for its economic growth. However, reports and independent investigations have shown that, within the industry, there is a diverse lack of effective knowledge sharing between domestic and international partners. The cause of these weaknesses was investigated in Chapter Five in the data analysis and findings.

The third chapter (literature review) brought together a number of key elements from the knowledge management literature in order to develop a better understanding of knowledge sharing and the new product development process. These key elements, such as knowledge transfer, knowledge creation and the NPD process, were all reviewed. Knowledge based theory of the firm and the role of knowledge management elements in the new product development process were investigated. It was argued that the ability to understand the technology and market knowledge (absorptive capacity), and experiences and expertise that were embodied in employees' minds or saved in the organisation's knowledge repository (prior knowledge) support the new product development process. In addition, literature about different types of knowledge (tacit and explicit), the development of the NPD process and knowledge-sharing and knowledge creation were also reviewed and at the end of chapter 3, there was a specific section on knowledge management in Iran. As Abdolshah and Abdolshah (2011) argued, the knowledge management concept in Iranian organisations is almost

a new subject and Iranian organisations are slowly developing this concept. Yet, compared to developed countries, knowledge management in Iran is in its early stages.

The fourth chapter (research methodology) described the methods that were used to gather the data in order to justify the research objectives and answer the research questions. This qualitative research is characterised by an emphasis on describing, understanding and explaining complex phenomena such as the relationships, patterns and configurations within the organisation (IKCO). As an interpretivist researcher, questions such as what/why/how helped the researcher to understand the research questions in a detailed way. As mentioned previously, case study method was the strategy chosen to undertake this empirical investigation. Open-ended questions give candidates the opportunity to respond in their own words rather than forcing them to choose from fixed responses. This qualitative method allowed the researcher the flexibility to investigate participants' responses. The semi-structured interview was identified as an important method for gathering evidence. This method of interviewing helped the researcher to ensure that the key knowledge management elements within IKCO were investigated.

In Chapter Five, the main research themes based on the participants' answers and the secondary data collected were identified and discussed:

- Knowledge-sharing through the knowledge repository
- Knowledge-sharing through interaction and socialisation
- Knowledge-sharing with international joint venture partners
- Knowledge acquisition, retention and creation within the R&D

A number of elements (sub-themes) were identified which were effectively influencing the four main themes mentioned above. Smith *et al., (*2007) argued that organisations are interested in particular types of tacit knowledge-sharing which provide value to their organisations. Based on the quotes above and the evidence

presented here, within IKCO there is valuable knowledge all around the organisation; this includes knowledge such as documents, reports, CADs, maps and expertise in different forms. However, the evidence shows that IKCO does not benefit from these valuable assets. A number of factors and elements, known to be causing fragmentation of the knowledge repository were identified. The organisational process was one of the central factors raised when the fragmented knowledge repository within IKCO was asked about. It was mentioned that knowledge has become known as power, in particular when the personnel felt that their job security was under threat. The staff believed that if the organisation or other colleagues needed them, they had more chance of surviving and securing their positions. If the holder of the knowledge (tacit or explicit) shared or stored his/ her knowledge then he/she would lose this power. The organisation's instability had shifted the balance of bargaining power and without this power the participants believed that it was impossible for them to survive. The hierarchy within IKCO had caused information limitation; if a member ha more information and knowledge, this meant that he/she was holding more power, and this was the main reason that knowledge holders tried to retain their valuable tacit and explicit knowledge and not store or share it in the common place. It was clear that the organisation did not have clear regulations encouraging personnel to avoid such behaviour.

Issues surrounding the recording of the knowledge of success and failure in IKCO's knowledge repository were another important factor within the organisational process. IKCO did not have clear guidelines to show its departments how to record knowledge of success and failure and every single department and individual acted independently. The evidence shows that within each department there is no specific person who traces all of the department's activities and writes about the problems faced along with situations and solutions. The participants mentioned that this information (knowledge of success and failure) is usually available in reports and the best person to consult is the project manager. However, IKCO does not have a clear central regulation on this matter, with regard to where everything should be written about, from the initiation up

to the end of the project. It was interesting to see that most of the participants mentioned their German and English partners as good examples of recording knowledge. The participants believed that the Germans and English recorded everything in their projects, and if the project manager left their job, the records were still there and there was no problem. However, the personnel and organisation could not learn from this lesson and the successful joint project (SD206) and unsuccessful domestic project were the best examples of this weakness. IKCO did not have a clear strategy to encourage its personnel to record the knowledge they had gained during the SD206 project.

The issues around the regulations and rules related to storing knowledge of success and failure within IKCO were obvious and every department stored its knowledge in different ways. However, the main concern was about having clear central regulations and rules that could be provided to IKCO's decision makers. Every department recorded its knowledge; however, there were no central record policies in IKCO as a whole, and it was difficult to find the knowledge. Importantly, in this case, the organisation tended to shoulder costs to buy the same knowledge that had been stored somewhere. Alavi and Leidner (2001) also argued that much of the knowledge an organisation needs can be found within the organisation; however, the main issue is whether the organisation can identify this existing knowledge. For example, one candidate mentioned a locker in the Strategy Department with over seven years of stored data (hard copy), but the issue was how to find a single page of data within this massive knowledge store.

Data classification was also a major issue and this had become a major problem when security and data protection became important for the organisation. The organisation (Security and Data Protection Department) believed that every single piece of data and knowledge, and every document was highly confidential material. The participants believed that it was safe if they kept their knowledge/data/information out of the

common place, to avoid the risk of sharing and storing confidential elements in a public place.

The concept of trust, the existing IT system and top management support were other major elements that could facilitate/influence/control the organisational process during the fragmentation of the knowledge repository. The issue of trust could be seen clearly in the example of the successful SD206 and in the failure of the domestic product highlighted. Having a low level of trust between members and IJVs could affect the process of storing knowledge effectively; in addition, the issue of trust could be seen more clearly when the knowledge became known as power amongst the members and IJVs. It is clear that if you do not trust your partners/colleagues then you will not feel able to share your interests with them. The existing IT system was highlighted as one of the key facilitators within the organisational process that could affect the process of storing knowledge. Borghoff and Pareschi (1997) and Davenport and Prusak (1998) all argued that the availability of certain information technologies has been important in improving and facilitating knowledge management activities (such as storing knowledge). However, the use of IT within IKCO was problematic, and issues relating to IT usage affected the organisational process when members tried to store their knowledge of success and failure in the knowledge repository.

Limited access to the software and hardware and a lack of clear central regulations on how to use IT in a better common sense and financial issues all affected the use of information technology for the storing of knowledge. It is important to highlight the security and data protection issues here. It was difficult to establish what kind of data could be stored and who could have access to data. The shortage of clear regulations on the classification and codification of the stored data can be seen as one of the main concerns here. Top management support with regard to storing knowledge in IKCO's knowledge repository was highlighted as one of the main elements that could influence and control the organisational process. Elements such as motivation, encouragement, reward and regulation on the knowledge storing process were

identified as part of the top management's supportive actions. The evidence shows that IKCO did not have clear central regulations/ rules on motivation, encouragement and reward when knowledge was stored by a member. However, every department had its own way of motivating and encouraging its staff to share and store their knowledge. There was no financial reward within IKCO; every department's reward system was different and rewards were non-monetary.

The purpose of this thesis was to investigate issues on knowledge-sharing in the new product development process in a single embedded case study (IKCO). The findings reveal a range of issues influencing three key knowledge-sharing processes within the IKCO. These three key knowledge-sharing processes are:

- Knowledge-sharing through a centralised knowledge repository;
- (Vertical) knowledge-sharing along the organisational reporting line;
- (Horizontal) knowledge-sharing across departments and knowledge-transfer from international partners.

Based on the findings, within IKCO, there is valuable tacit/explicit knowledge across the organisation. This knowledge (explicit) could be documented or it could be embedded in employees' minds (tacit) across the organisation. However IKCO, as the owner of this valuable knowledge (tacit /explicit), could not fully benefit from it, and there were always issues surrounding the sharing of knowledge between members, departments and IJV partners.

The first issue identified was when knowledge became known as power amongst IKCO's members. The participants mentioned that this issue occurred when they felt that their job security within IKCO was very poor. The majority of the participants believed that, if IKCO or other colleagues needed their knowledge, then they had more chance of surviving and securing their positions. The candidates believed that if they shared or stored their knowledge, they might lose the power. Instability of

organisations at a macro or micro level, such as political change at a macro level and managerial change at a micro level, shift the balance of bargaining power and without this power it is impossible for one to survive. The hierarchy was identified as one of the issues that was causing knowledge-sharing fragmentation within the IKCO. The hierarchy caused information limitation, and the majority of the participants highlighted that, if a member had more information and knowledge, then this meant that they held more power. There was no reason to share this power with any others, as highlighted by the participants. It was mentioned that IKCO did not have clear guidelines or regulations that encouraged the personnel to avoid such behaviour. As mentioned in the previous chapter, IKCO did have knowledge repositories across its departments. The main concern was related to the way that knowledge of success and failure was recorded within these repositories. First of all, there was a lack of clear guidelines to show the departments how to record knowledge and this issue was pointed out by the majority of the participants. The evidence collected shows that within the departments there was no specific person to trace the department's activities and record the problems faced along with the solutions. The participants argued that the organisation did not have clear regulations on this issue and that each department recorded knowledge of success and failure in different ways, in different formats and using different categorisations. In addition, it was difficult to identify specific knowledge within these repositories; in this case, IKCO tended to bear costs because it would buy the same knowledge that was stored somewhere within the organisation. In addition, a lack of connection between different repositories was another issue. Data classification was also identified as one of the major issues in storing knowledge of success and failure within IKCO's knowledge repository. Data protection had become important for the organisation and the Security and Data Protection Department believed that every single piece of data and knowledge, and every single document was highly confidential material. The majority of the participants argued that, to avoid the risk of sharing confidential material, they preferred not to share information or data in the knowledge repository. Other factors, such as the existing IT system, top management support and the concept of trust, were other major elements influencing

knowledge-sharing within IKCO's knowledge repository. The IT system at IKCO was highlighted as one of the facilitators of knowledge-sharing within the organisation. However, limited access to software and hardware, financial issues and a lack of clear guidelines all affected the use of IT in the knowledge-sharing process. The majority of the participants highlighted that it was difficult to understand what kind of data could be stored and who could access those data. Participants also mentioned that financial difficulties have caused the organisation's hardware and software to remain out-of-date. Top management support was one of the key factors potentially influencing knowledge-sharing within IKCO. Elements such as personnel motivation, encouragement and personnel reward systems were identified as part of top management's supportive action. However, the insatiability of the policy makers at the macro and micro levels had caused a diversity of management attitudes within IKCO. The evidence collected shows that, within the organisation, departments have different motivation, encouragement and reward systems and each department acts in different ways. However, the reward systems within the departments were non-monetary. In a state-owned organisation, such as IKCO, the majority of policies and regulations are made by the top managers. However, the instability of the top managers (due to the international and national political circumstances) does not allow the organisation to establish long-term plans, policies and regulations; all of these are unstable and one early decision can easily be rejected or ignored by new managers.

I have aimed to investigate issues on knowledge-sharing in the new product development process within a single embedded case study called Iran Khodro Company (IKCO). I have argued that IKCO is Iran's most important automotive company and it has struggled to develop new products independently, despite its experience of jointly developing new products with international partners. I have argued that western theories on knowledge sharing and knowledge transfer can be applied, refined or developed in the Iranian context. This empirical study was based on 40 in-depth semi-structured qualitative interviews conducted with 25 senior and middle managers from key important departments relevant to the NPD process.

Besides the primary data, secondary data based on published industry reports, unpublished company reports and other international reports supported the analysis of the interview data.

The findings show that within the organisation a range of elements influence the four key knowledge-sharing themes. The findings show that although theory on knowledge-sharing and knowledge-transfer developed in the West are applicable to the Iranian context to some degree. The knowledge-sharing process is significantly controlled by the idiosyncratic organisational context, which in turn is significantly influenced by the wider context, such as the political regime, industry dynamics, technological development and institutional framework. The final research framework (figure 15) clearly shows that within IKCO the knowledge-sharing process become knowledge-transfer. One side (of IJVs) may benefit from the joint business and the other side may not. However, as we already disused, IJVs are a way for overseas businesses to enter new markets faster with lower risks and on the other hand learning in the host organisation has always been recognised as one of the main motivations of IJV establishment (Lane *et al.*, 2001)

7.1. Empirical Contribution

This research, as an empirical study, had the opportunity to investigate the knowledge-sharing concept in the new product development process in one of the most important automakers (IKCO) in Iran. However, due to the international and national political and economic circumstances in Iran, there are always access limitations for researchers; these limitations make it difficult for researchers to deeply and freely investigate issues within the Iranian automotive industry. For example, a comparison between the number of studies which have been done on Western or international automakers and Iranian automakers shows that there is a gap between the quantity and quality of these research works. This is further highlighted by the limited number of academic studies on the Iranian auto industry within international academic journals.

The Iranian automotive industry is a unique area for empirical studies, and has the potential to create good opportunities for researchers (who are able to) to investigate and examine methods and theories.

7.2.   Limitations and Further Research

This study has a number of limitations that further research should address. First, due to time and budget limitations, this study focused on a state-owned single case study. However, it would be better to include another case study that is privately owned, with both organisations' views on knowledge sharing in the NPD process. Second, during the fieldwork, it was impossible to interview and meet the foreign partners (Peugeot's employees working in IKCO); this issue caused a limitation with regard to the foreign partners' views being addressed to meet the research objectives. It is recommended that further research should try to access overseas' employees, and ask questions and interview them. Third, as mentioned previously, in many emerging countries, such as Iran, the government is directly involved in relationships with foreign investors (Ferretti & Parmentola, 2010, p.175). During this study there were several ways in which the macro and micro scales effectively influenced this research. International and national political factors, such as government change in Iran and international sanctions against it, caused difficulties in completing the research smoothly and on time. As already mentioned, in emerging countries such as Iran, political exchange may cause business and management activities to be impacted very easily and researchers should take additional care with regard to how such upcoming issues are tackled. Fourth, due to the aforementioned issues and the access limitations to both the organisational and state data, this research mainly adopted a qualitative approach. Subsequent research should try to find ways to gain access to the data and to apply quantitative methods to the study as an additional supporting tool. The researcher hopes that further research continues to challenge and explore knowledge-sharing activities within the NPD process, and that the results may help organisations to share knowledge smoothly and freely amongst members, departments and organisations.

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APPENDICES

APPENDICES

Appendix 1: Opening Questions

Main questions	Probing questions	Interviewees
1. Please tell me about yourself?	➢ Age: (How old are you?) ➢ Educational background: (What subject / degree have you studied?) ➢ Current job positions: (What is your current job position in IKCO?) ➢ Length of current job at IKCO: (How long have you been working in your current position?) ➢ Why you joined IKCO: (What was the reason you joined IKCO?) ➢ How you joined IKCO: (How you became a member of IKCO?) ➢ Length of time at IKCO: (How long have you been working for IKCO?) ➢ Past job location: (Where did you work before coming to IKCO?) ➢ Past job positions: (What was your job position in the previous job?) ➢ Length of pervious job before IKCO: (How long did you work in your current position?) Gender : M F	All
2. Tell me about the history of IKCO?	➢ When did IKCO set up? ➢ How did IKCO set up? ➢ Key events in IKCO history? (e.g. change of leadership, change of structure, change of ownership, political regime)? ➢ Which important new technologies introduced in the past in IKCO's history?	3 A, B, C, D, E
3. What does your department do?	➢ What is the main role of your department within the company? ➢ How can you describe the relationship between your department and JV?	All
4. What role do you play within your depart. ?	➢ What is your responsibility within your department? ➢ Who reports to you and who do you report to? ➢ How many people do you supervise and manage? ➢ Please describe your typical day in the office? Please give me an example?	All

Appendix 2: General questions:
Some general questions will be collected from the company databases

Main questions		
1. The company personnel's educational background within different departments (How many people in each) • Particular attention to the background of the R&D and Marketing departments • The difference between domestic and JV staff 's background	➤ High School ➤ HND ➤ BSc/BA ➤ MSc/MA ➤ PhD	From databases or get from VPs or Heads of departments
2. The company personnel's educational background in terms of subjects within different departments? • Particular attention to the background of the R&D and Marketing departments • The difference between domestic and JV staff 's background	➤ For example : ➤ BSc in mechanic? ➤ BSc Electronic? ➤ BA Finance?	From databases or get from VPs or Heads of departments
3. Categorising personal work experience within different departments? • Particular attention to the background of the R&D and Marketing departments • The difference between domestic and JV staff 's background	➤ Less than 5 years ➤ Between 5-10 years ➤ Between 10 – 15 years ➤ Between 15 – 25 years ➤ Between 25 – 30 years ➤ More than 30 years ➤ In Iran staff can work maximum 30-years	From databases or get from VPs or Heads of departments
4. R&D intensity to measure ACAP at business unit level. Marketing intensity will be measured at business unit level. • R&D intensity shows expenditure in R&D department. • Where they spent this money. For example; they spent this amount of money for expanding their buildings or they spent this money on a new technology. And the rate of inflation have to be recognised year by year • This is going to be year by year from 1997 (establishment of R&D) till 2010.		From databases

Main questions:

What is the role of prior knowledge in the process of knowledge transfer in the NPD process? Prior knowledge means that the knowledge which is available within the organisation from the past experience and project and it can be documented or it can be in people's mind

Appendix 3: Prior knowledge

3. Prior Knowledge (PK)		
Main questions	Probing questions	Interviewees
1. Where do you go if you need help or if you have problem?	➤ Do you refer to recorded information ➤ Do you refer to company regulations? ➤ Do you refer to technical manual? ➤ Do you go and ask your colleagues? ➤ Do you ask people outside your company, such as family, friends and ex-classmates?	All
2. What are the most common problems you come across? 3. Tell me about a specific example?	➤ How do you solve these problems?	All
4. How do you record success and failure of your past projects?	➤ Who is responsible for recording the information? ➤ Who has access to such information? ➤ How do you use the information recorded whether success or failure?	All
5. How do you gather market feedback about your products and who do you report to these market feedbacks?	➤ How do you gather domestic feedback? ➤ How do you gather international feedback? ➤ What steps do you take to apply these feedbacks to development of a new product? ➤ Please tell me an example?	3 B , E

What is the role of absorptive capacity in the process of knowledge transfer in the NPD process?

Absorptive capacity is an ability to recognise issues, analyse those issues and solve and find answers for those issues

Appendix 4: Absorptive Capacity

4.1 Absorptive Capacity (ACAP)		
Main questions for Acquisition capacity	Probing questions	Interviewees
AD1: 1. Who are the key players / firms in the auto sector? 2. What is the position of your company in the auto sector? 3. Who are potential competitors to your sector?	➢ Who is responsible for gathering the information? ➢ How do you gather information on them? ➢ What kind of information do you collect? ➢ How do you use the information? ➢ Who has access to the information?	3 , 4 , 5 , A, B, C , E
AD2 & AD3: 4. What sort of relationships do you have with external knowledge sources such as R&D / technical institutes and universities? 5. Could you take me through a specific example please?	➢ Who are the most important and valuable? ➢ How do you gather information on them? ➢ Who is responsible for gathering the information? ➢ What kind of information do you collect? ➢ How do you use the information? ➢ Who has access to the information?	3 , 4 , 5 , A, B, C ,E

Above questions will measure: Acquisition capacity

AD1: knowledge of the competition   AD2: Openness towards the environment   AD3: R&D cooperation

4.2 Absorptive Capacity (ACAP)		
Main questions for Assimilation capacity	Probing questions	Interviewees
AS1, AS6 & AS5 1. How do you encourage employees to increase their knowledge / skills? 2. Can you give me a specific example? 3. How do you identify training needs for employees?	➢ Is this successful and why? ➢ How can you have access to external events (e.g. conferences) ?	2, 3 , 4 , 5 , B, C , D , E
AS2: 4. What technologies / new business processes / new manufacturing processes / new ways of doing things have you introduced in your current role? (depends on who I am interviewing) 5. Have they all been successful? 6. Take me through a specific successful example? 7. Take me trough a specific unsuccessful example? 8. What have you learnt from the experience?	➢ What have you done differently since then? ➢ What would you do differently from now on? ➢ Why?	2, 3 , 4 , 5 , B, C , D, E
AS3: 9. What do you do that is different from other firms in your sector? 10. Take me trough a specific examples? 11. Are there lessons (success or failure) from other firms in the sector that you are thinking of applying? 12. Why? Take me through a specific example?	➢ How do you think these lessons will change the company? ➢ Improvement (better) or / worse	2, 3 , 4 , 5 , B, C , D, E
AS4: 13. In what kind of circumstances employees can attend and present papers at scientific conferences and congresses. Or receive outside staff on research attachments?	➢ Are there any benefits for employees who are attending and what are those benefits? ➢ When they return, how do they share the information with other people in the company? ➢ And who do they share with?	3 , 4 , 5 , A, B, C ,

Above questions will measure: Assimilation capacity

AS1: Assimilation of technology   AS2: Human resources   AS3: Industrial benchmarking   AS4: Involvement in spreading the knowledge   AS5: Attendance at training courses and professional events   AS6: Knowledge management

4.3 Absorptive Capacity (ACAP)		
Main questions for Realized ACAP Transformation capacity	Probing questions	Interviewees
TR1: 1. How do you manage and use information technologies (IT) in order to improve information flow?	➢ What IT facilities do you have? ➢ How do you encourage your staff to use IT to share knowledge? ➢ How do you manage virtual meetings between professionals?	3 , 4 , 5 , A, B, C ,E
TR2: 2. What would you say are the firm's key capabilities / strengths in NPD? 3. What do you do differently in NPD from other firms in the automotive sector? 4. Is there any good practice in NPD in others firms that you could learn from	➢ How you can improve the ability of the firm's capacity to get rid of out of date internal knowledge, thus motivating the search for different innovation? ➢ R&D, specifically laboratory and equipment, staff, ➢ How is integration between departments? ➢ How is integration with external sources?	3 , 4 , 5 , A, B, C ,E
TR3: 5. How do you adapt technologies designed by others to the firm's particular needs? 6. Take me through a specific example?	➢ Who in the company are responsible for / expert in this area? ➢ Do you work with firm (s) or experts outside the company when adapting technologies?	3 , 4 , 5 , B, C
TR4: 7. How do you encourage your staff to share their own knowledge and information with others?	➢ How does the organisation benefit from staff's knowledge? ➢ How is the staff who shares knowledge with others rewarded?	3 , 4 , 5 , A, B, C , E
TR5: 8. In terms of managing the R&D process within the organisation, how do you coordinate tasks between engineers, production lines and marketing people? 9. How do R&D and marketing departments work together? 10. Take me through a specific example?	➢ Is there any routine plan for this coordination programme? ➢ Who makes the final decision if any differences among different people / departments?	3 , 4 , 5 , B, C , E

Above questions will measure: Realized ACAP

TR1: Transmission of the IT-based knowledge   TR2: Renewal capability   TR3: Adaptation capacity

TR4: Exchange of scientific and technological information   TR5: Integration of R&D

4.4 Absorptive Capacity (ACAP)		
Main questions for Application capacity	Probing questions	Interviewees
AP1: 1. What new technologies are you implementing at present? 2. What have been the challenges and how do you deal with them?	➢ How do you categorise level of organisational / technical adaption?	3 , 4 , 5 , B, C
AP2: 3. What steps do you take to apply a new knowledge into product and process development?	➢ When you find out a new knowledge / information; how you are going to apply and use it in your own NPD process? ➢ Who are the key people you should talk to about this and how makes the final decision? ➢ Generally speaking, how long does it normally take for a decision to be made?	3 , 4 , 5 , A, B, C , E
AP2: 4. If you want to introduce a new technology – how would you go about it? Take me through a specific example?	➢ What are the procedures? ➢ Take me through a specific example?	3 , 4 , 5 , A, B, C ,
AP3: 5. What are the key pressures (political, economic, social, technological, legal, competitive, etc.) on the company in terms of the marketplace and how do you think you will respond to these pressures?	➢ Who is responsible for gathering the information? ➢ How is the information circulated and discusses? ➢ Who are involved in the decision making if any action must be taken? ➢ Take me through a specific example?	3 , 4 , 5 , A, B, C , E

Above questions will measure: Application capacity

AP1: New knowledge exploitation   AP2: Development of patents   AP3: Technological proactiveness

Appendix 5: Knowledge Creation

5. Knowledge Creation (KC)		
Main questions for	Probing questions	Interviewees
1. How do you encourage employees to develop new ideas / technology?	➢ How / when do you encourage your employees to test and exchange unusual knowledge and ideas? ➢ What happens if they are successful? ➢ What happens if they are not successful?	3 , 4 , 5 A , B , C , E
2. How are colleagues encouraged to cooperate with others and in what situation?	➢ How are staffs motivated to exchange knowledge with group members?	All

1: Culture for risk taking   2: Culture for teamwork   3: Number of new product and service (to be asked in general questions)

4: Knowledge Stocks   (a part of screening questions)

Appendix 6: Knowledge Transfer

6. Knowledge Transfer (KT)		
Main questions for	Probing questions	Interviewees
1. Tell me about how your department works with the JV 2. Tell me how your department (JV) works with other domestic departments. 3. How are t he key people liaising / coordinating the work between JV and domestic depart ments? 4. How do you exchange knowledge and expertise between JV and domestic departments? Take me through a specific example. 5. What are the major difference in terms of way of working between JV and domestic depart ments (OR how do JV and domestic departments work differently)? 6. In what areas do JV and domestic departments work together?	➢ Did you actively transfer locally developed technological /know-how to other manufacturing or R&D units between 1997 -2010 (In 1997 the first national brand introduced). ➢ What steps do you take when you want to transfer your knowledge to other R&D / organisation? ➢ Have you received by the same means as above technological know-how developed from other R&D units into your company between 1997 -2010 (In 1997 the first national brand introduced).	3 A,B,C,D
7. What has been learnt from the JV? Can you give me specific examples? 8. How are such lesson transferred into the departments? 9. Which department has benefited the most? And why? 10. Which department has benefited the least? Why? 11. What has the JV learnt from you?	➢ In terms of processes ➢ In terms of technology ➢ In terms of skills	2 , 3 A , B , C , E

Appendix 7: New Product Development

7. New Product Development (NPD)		
Main questions for	Probing questions	Interviewees
New product development types: 1. How does your department approach NPD? Take me through the process of developing a particular new product in recent years? 2. Have you tried different approaches in the past? 3. How did it work? Take me through a specific example? 4. Are you aware of other approaches to NPD in other firms? And whether you are thinking of adopting one of these approaches?	➢ How / where a new NPD project usually starts? ➢ Who are the key decision makers? And who else are involved? ➢ Where is the idea from (top, middle management or shop floor)? ➢ How do you explain relationships with other NPD ? ➢ Does each department carry out it is own special task within the new product development process or is there one team responsible for all development process? ➢ What is the role of marketing and sales people in the NPD process?	4 , 5 B , C, E
Success: 5. How do you measure the success or failure of your individual new product development projects? 6. What measure of success do you currently use? (financial / Non-financial)	➢ What measure do you think would be best evaluate the success or failure of the new products your organisation introduces? ➢ How do you test and validate these developments? ➢ At what stage do you bring in customers' opinion / influence on NPD?	3 , 4 , 5 B , C , D , E
Process: 7. What is the source of most new product ideas?	➢ How do you validate your product for the end customer?	3 , 4 , 5 B , C , E
8. How do you work with your suppliers?	➢ Have they (suppliers) ever put forward a new suggestion and what did you do with their suggestions? ➢ Please give me an example	3 B, E,

Q: Is there anything else about the organisation / department that you think I should know (will help my research) or any final comments you would like to make?

Appendix 8: Closing questions:

➢ Thanks

➢ Whether I will talk to him/her again to clarify some points

➢ I will tell him/her that the interview is over. Off the record, ask him/her to tell me how they feel about working in the company.

➢ I will note down his/her personal reflection straightaway after the interview.

➢ **** This is a very important process to reflect whether they have given me genuine answers or official lines.

These questions will be asked in terms of 3 different brands   (SD, SAMAND & 5-Doors SAMND)

Appendix 9: Inter - Org Factors:

(A)
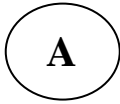
A1. Can you describe how you are working with different international partners?

A2. What issues did you face during a project when you worked with the international partners?

A3. What were the key issues during SD206, SAMAND, 5-Door SAMAND?

A4. How did you resolve the issues?

A5. Describe your working style and is there any difference before and after your JVs projects?

A6. How do you describe the working approach of the different international partners?

A7. Did you fell to adopt your working style? What did you do to adopt yourself?

A8. What have you learned most from each partner and how did that take place?

A9. How did you use that knowledge?

A10. Is / was there anything or other factors that influenced your relationship with each of your partners (French, German, Korean, and Japanese)?

A11. What could you have done to learn more from your partners? Can you give me an example when you tried to learn from your partners?

A12. Where and how do you get your information about what is happening in the production lines?

A13. Are you happy with the style of the transferring information from production lines to you?

Appendix 10: Organisational Factors:

B

B1. How would be different if the IKCO was a private company?

B2. How do you feel about the automotive technology in Iran compared with the international competitors?

B3. How do you rank IKCO's cars quality in the Iranian and International market?

B4. What is your strength and weaknesses compared with each of your international partners?

B5. How did people at the top perceive these three products?

B6. Do you have any system to capture new knowledge, transfer it and save at IKCO?

B7. How do you define successful and unsuccessful in the NPD project?

B8. What is the most successful project in the NPD and why?

B9. What is the most unsuccessful project in the NPD and why?

B10. How would you characterise the support you are getting from IKCO's board for the R&D activities within SD, SAMAND, and 5-Doors SAMAND?

B11. How do you identify the roles and responsibilities among employees? I have notice that there is product quality role in the R&D department and also in Production department and also in SAPCO? How do you identify and explain this?

B12. Is there any incentive to do some new ideas for staff?

B13. What type of projects do you enjoy more?

B14. What is your definition about risky project?

B15. Where newcomers / new employees come from in last 2 years and most recently?

B16. Who IKCO not to effort to lose and why?

B17. Who in your view is the technical expert, and why?

B18. Who makes things happened? (Within the department, project champions, in terms of SD, SAMAND and 5-Doors) and what made them effective?

B19. How do you record knowledge, particularly success and failure and who has access to this knowledge?

B15. What would make it easy to share knowledge between different departments at IKCO?

B16. How do you try to retain the key people?

B17. How do you work with other departments and is there anything that would help you to work better with them?

Appendix 11: R&D Department Factors:

C
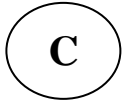
C1. Did you find it easy or difficult to work with your international partners and why> and what would helped?

C2. How do you get information from your customers and how do use this information?

C3. How do you work with your suppliers?

C4. What have you learned from suppliers?

C5. What is the role of the SAPCO and how do you coordinate with SAPCO?

C6. What would help you to work better with your suppliers?

C7. What have you learned from that project?

C8. Do you think the SD206 project was successful or unsuccessful and why?

C9. Why 5-Doors Samand was unsuccessful?

C10. What lessons were learnt from SD206?

- If the answer is no lessons learnt, then I will ask why they could not learn
- If the answer shows that they have learnt from SD, I will ask: why they could not apply those lessons to 5-Door SAMANDS

C11. How do you work with universities in Iran?

C12. How do you make sure that you get the up-to-date data & technologies in the world?

C13. How did you come to IKCO? Who are the key knowledgeable people inside or outside IKCO?

C14. What do you reckon is the best way to attract these talented people?

C14. Do you know the history of IKCO? What do you know? And who did you hear that from?

Appendix 12: For the French Members only:

F

Name; Positions; The duration of work at IKCO; The work experience; Education; work background:

F1-Can you tell me the history of French and IKCO JV?

F2-Can you tell me when you started to work at IKCO and what is your role and responsibilities?

F3- How do you describe your relationship with IKCO?

F4- Can you describe working style of IKCO?

F5- How do you communicate with the IKCO?

F6- In what areas can you communicate with the IKCO?

F7- Are there some aspects that Peugeot does not want to share with IKCO?

F8- Who is the key person within this JVs relationship and what these people do and how they communicate with each other?

F9-What do you think about the SD & 5-door Samand projects & reasons for success and failure?

F10- What have you and IKCO learned from each other and how did that take place?

F11-Is there any other factors that influence the learning from each other?

F12-Do you involve IKCO in the design of a product or development of a project?

F13-How does Peugeot benefit from this JV with IKCO?

F14- What contribution does Peugeot make to IKCO?

F15- What contribution does IKCO make to Peugeot?

F16- How IKCO can benefit from this JV?

F17-How do you see political factors influence this relationship?

F18. What is surprised you about working with IKCO?

F19- Why Peugeot wants to have JVs relationship with IKCO? And what was the benefit for Peugeot?

F20- Was / is there any target for this JVs relationship for Peugeot?

F21- What is the strength and weaknesses of IKCO?

Appendix 13: First visit Questions in Persian

	سئوالات اصلی	سئوالات فرعی	Interviewees	
	5. نکاتی در مورد خودتان به من بگوئید ؟	1. سن تان ؟ 2. مدرک تحصیلی؟ 3. شغل فعلیتان در ایران خودرو؟ 4. مدت اشتغال به شغل فعلی در ایران خودرو؟ 5. علت پیوستن به ایران خودرو؟ 6. نحوه آغاز به کار شما در ایران خودرو؟ 7. به چه مدت در ایران خودرو مشغول به کار هستید؟ 8. شغل قبلی شما در چه ارگانی بود؟ 9. مسئولیتتان در شغل قبلی چه بود؟ 10. مدت اشتغال به کار قبلی؟ 11. جنس؟	All	
	6. مختصری در خصوص تاریخچه ایران خودرو به من بگوئید ؟	1. تاریخ افتتاح ایران خودرو؟ 2. نحوه آغاز به کار ایران خودرو؟ 3. رویداد های مهم در تاریخچه ایران خودرو به عنوان مثال تغییر مدیریت ؟ 4. مهمترین تکنولوژی به کار رفته در ایران خودرو به نظر شما چیست؟	3 A, B, C, D, E	
	7. مسئولیت های حوزه ای که در آن مشغول به کار هستید ؟	1. مهمترین مسئولیت حوزه شما در ایران خودرو چیست؟ 2. نحوه ارتباط بخش شما با قسمت JV چگونه است ؟	All	
	8. مسئولیت کاری شما در بخش که در آن فعال هستید چیست ؟	➤ مسئولیت شما در بخشتان چیست ؟ ➤ چه کسانی به شما گزارش میدهد و شما به چه کسی گزارش میدهید؟ ➤ چند نفر تحت نظارت شما فعالیت می نمایند؟ ➤ لصفا یک روز کاری تان را با ذکر مثال مختصرا توضیح دهید؟	All	

Main questions:

What is the role of prior knowledge in the process of knowledge transfer in the NPD process?

Prior knowledge means that the knowledge which is available within the organisation from the past experience and project and it can be documented or it can be in people's mind

2. Prior Knowledge (PK)		
Main questions	Probing questions	Interviewees
6. در صورت بروز مشکل به کجا مراجعه می نمائید؟	1. آیا به آرشیو اطلاعاتی کارخانه مراجعه می نمائید؟ 2. آیا به آیین نامه کارخانه مراجعه می نمائید؟ 3. آیا به دفترچه راهنما مراجعه می نمائید؟ 4. آیا با همکارانتان مشاوره می نمائید؟ 5. آیا با آشناهایتان در خارج از کارخانه مشورت مینمائید؟	All
7. رایجترین مشکلاتی که با آن روبرو می شوید؟ 8. لطفا با ذکر مثال توضیح دهید؟	1. معمولا برای حل چنین مشکلاتی چه راهی را پیش می گیرید؟	All
9. چگونه موفقیتها و یا شکستهای احتمالی در پروژه های کاری گذشته را ثبت می نمائید؟	1. چه کسی مسئول ثبت این اطلاعات مب باشد؟ 2. چه کسی دسترسی به این اطلاعات را دارا می باشد؟ 3. چگونه از این اطلاعات استفاده می نمائید؟	All
10. چگونه اطلاعات بازاریابی را جمع آوری میکنید و به چه کسانی این اطلاعات را گزارش می دهید؟	a. چگونه اطلاعات بازاریابی داخلی را جمع آوری می نمائید؟ b. چگونه اطلاعات بازاریابی خارجی را جمع آوری می نمائید؟؟ c. چه اقداماتی را جهت استفاده از این نظر سنجی ها در ارتقای محصولات تولیدی و یا خدمات به عمل می آورید؟ d. لطفا مثالی را در این باره بیان کنید.	3 B , E

What is the role of absorptive capacity in the process of knowledge transfer in the NPD process?

Absorptive capacity is an ability to recognise issues, analyse those issues and solve and find answers for those issues

3.1 Absorptive Capacity (ACAP)		
Main questions for Acquisition capacity	Probing questions	Interviewees
AD1: 6. چه کسانی/شرکتها حرف اول را در صنعت خودرو می رنند؟ 7. موقعیت ایران خودرو در صنعت خودروی ایران چیست؟ 8. مهمترین رقبای تجاری شما چه کسانی هستند؟	• چه کسی مسئول جمع آوری اطلاعات در باره این موضوع می باشد؟ • چگونه این اطلاعات جمع آوری می شوند؟ • چه نوع اطلاعاتی را جمع آوری می کنید؟ • چگونه این اطلاعات مور استفاده قرار می گیرند؟ • چه کسی دسترسی به این اطلاعات را دارا می باشد؟	3 , 4 , 5 , A, B, C , E
AD2 & AD3: 9. سطح روابط شما با منابع اطلاعاتی و تحقیقی خارج از شرکت مانند دانشگاه ها چگونه می باشد؟ 10. آیا می توانید موردی را در این باره توضیح دهید؟	• چه کسانی مهمترین و با ارزشترین منبع می باشند؟ • چگونه این اطلاعات جمع آوری می شوند؟ • چه نوع اطلاعاتی را جمع آوری می کنید؟ • چگونه این اطلاعات مور استفاده قرار می گیرند؟ • چه کسی دسترسی به این اطلاعات را دارا می باشد؟	3 , 4 , 5 , A, B, C ,E

Above questions will measure: Acquisition capacity

AD1: knowledge of the competition   AD2: Openness towards the environment   AD3: R&D cooperation

3.2 Absorptive Capacity (ACAP)		
Main questions for Assimilation capacity	Probing questions	Interviewees
AS1, AS6 & AS5 14. چگونه کارکنان را برای کسب مهارت و دانش بیشتر تشویق مینمائید؟ 15. آیا می توانید مثالی در این باره ذکر کنید؟ 16. چگونه تشخیص به نیاز آموزش دیدن کارکنانتان می دهید؟	➤ آیا این روش موفقیت آمیز می باشد؟ ➤ چگونه می توانید به دانش خارج از شرکت مانند کنفرانسها دسترسی داشته باشید؟	2, 3 , 4 , 5 , B, C , D , E
AS2: 1. چه راهکار تجاری/تکنولوزی نوین/ روش جدید تولید /روش نوین انجام کار خاص را به کار برده اید. (بستگی به مصاحبه شونده دارد) 2. آیا تمامی روشهای به کار رفته موفقیت آمیز بوده اند؟ 3. لطفا مثالی در قبال موفقیت آمیز بودن روش به کار رفته ارائه نمائید 4. لطفا مثالی در قبال نا موفقیت آمیز بودن روش به کار رفته ارائه نمائید 5. چه تجربیاتی را از بکار بردن این روشها به دست آورده اید؟	➤ چه چیز خاصی را متفاوت از قبل انجام داده اید؟ ➤ چه چیزی را متفاوت انجام خواهید داد؟ ➤ چرا؟	2, 3 , 4 , 5 , B, C , D, E
AS3: 1. چه کاری را متفاوت از دیگران در حوزه خودتان انجام می دهید؟ 2. لطفا با ذکر مثال توضیح دهید 3. آیا در فکر به کار بردن تجربیات رقبایتان در حوزه کاریتان هستید؟ 4. چرا؟ لطفا با ذکر مثال توضیح دهید	➤ پیشبینی شما از عاقبت به کار بردن این تجربیات چیست؟ ➤ پیشرفت و یا پسرفت؟	2, 3 , 4 , 5 , B, C , D, E
AS4: ○ به چه نحوی کارکنان می توانند مقالات خود را در کنفرانسهای علمی و یا صنعتی ارائه دهند و یا از محققان خارج از محدوده شرکت مشارکت بگیرند؟	➤ آیا فوایدی حاصل کارکنانی که در این نوع کنفرانسها شرکت می کنند می شود؟ ➤ به چه نحوی کارکنان داشن آموخته ای خود از این چنین کنفرانسها را به اشتراک می گذارند؟ ➤ با چه کسانی این اطلاعات را به اشتراک می گذارند؟	3 , 4 , 5 , A, B, C ,

Above questions will measure: Assimilation capacity

AS1: Assimilation of technology   AS2: Human resources   AS3: Industrial benchmarking   AS4: Involvement in spreading the knowledge   AS5: Attendance at training courses and professional events   AS6: Knowledge management

3.3 Absorptive Capacity (ACAP)		
Main questions for Realized ACAP Transformation capacity	Probing questions	Interviewees
TR1: ○ نحوه مدیریت و استفاده از ای تی جهت انتقال اطلاعات را در حوزه خود توضیح دهید ؟	● امکانات موجود IT را نام ببرید ؟ ● چگونه به کارگیری ای تی را در بین کارکنانتان ترویج میکنید ؟ ● به چه طریق ملاقاتهای مجازی را مدیریت میکنید ؟	3 , 4 , 5 , A, B, C ,E
TR2: 1. به نظر شما نکات قوت حوزه NPD در شرکت چیست ؟ 2. چه روشهای متفاوتی در مقایسه با رقیبان خود در حوزه NPD انجام میدهید؟ 3. آیا روشهای خاص و مفیدی در حوزه NPD از رقیبان خود سراغ دارید که میتوانید از آن استفاده بکنید ؟	● چگونه میتوانید قدرت دفع اطلاعات غیر ضروری و کهنه شرکت را بهبود بخشیده ؟ و قدرت خلاقیت به وجود آوردن محصولی جدید را بهبود ببخشید ؟ ● R&D و یا آزمایشگاه و یا وسایل آزمایشی ؟ ● چگونگی ارتباط بین دپارتمانها ؟ ● چگونگی ارتباط با مؤسسات خارج از شرکت ؟ ●	3 , 4 , 5 , A, B, C ,E
TR3: 1. چگونه تکنولوزی های ابداء شده توسط دیگران را بکار میگیرید؟ 2. لطفا مثالی را در این باره ارائه دهید؟	● چه کسانی مسئولیت این کار را بر عهده دارند؟ ● آیا برای به کار گیری تکنولوزی های جدید از منابع خارج از شرکت استفاده می نمائید؟	3 , 4 , 5 , B, C
TR4: 1. به چه نحوی کارکنان را ترغیب به سهیم کردن همکارانشان از تجربیات شخصی و یا حرفه ای می نمائید؟	● سازمان شما چگونه از دانش کارکنان بهره می برد؟ ● آیا کارکنانی که دانش خود را به اشتراک میگذارند از طرف شرکت تشویق می شوند؟ / به چه نحوی؟	3 , 4 , 5 , A, B, C , E
TR5: 1. در ارتباط با مدیریت R&D در شرکت ایران خودرو ، چگونه هماهنگی بین مهندسین و خطوط تولید و بازاریابان ایجاد میکنیید؟ 2. چگونگی ارتباط بین بخش R&D و بازرایابی را توضیح دهید؟ 3. لطفا مثالی را در این باره ارائه دهید ؟	● آیا روال خاصی در مورد هماهنگی وجود دارد؟ ● در صورت بروز اختلاف و یا ناهماهنگی بین بخشها تصمیم نهایی با کیست؟	3 , 4 , 5 , B, C , E

Above questions will measure: Realized ACAP
TR1: Transmission of the IT-based knowledge   TR2: Renewal capability   TR3: Adaptation capacity
TR4: Exchange of scientific and technological information   TR5: Integration of R&D

3.4 Absorptive Capacity (ACAP)		
Main questions for Application capacity	Probing questions	Interviewees
AP1: 3. چه تکنواوزی نوینی را در حال حاضر اجراء می نمائید؟ 4. با چه مشکلاتی در این راه رودرو شده اید و به چه نحوی سعی در برطرف کردن آنها دارید؟	➢ سطح سازمان دهی و اقتباس تکنولوژی را چگونه طبقه بندی می نمائید؟	3 , 4 , 5 , B, C
AP2: 3. چه اقداماتی را در جهت به کار گیری دانش و فن آوری های نوین به عمل می آورید؟	➢ هنگامی که دانش و یا اطلاعات جدیدی را کسب می کنید کارمیگیرید؟ NPDچگونه آنرا را در فرایند ➢ چه کسانی در این مورد تخصص دارند و چه کسی تصمیم نهایی را اتخاذ میکند؟ ➢ برای اتخاذ تصمیم نهایی عموما چقدر وقت لازم است ؟	3 , 4 , 5 , A, B, C , E
AP2: 4 . چگونه تکنولوژی جدید را به کار می گیرید لطفا با ذکر مثال توضیح دهید؟	➢ روند کار چیست؟ ➢ لطفا با ذکر مثال توضیح دهید	3 , 4 , 5 , A, B, C ,
AP3: 5 . از لحاظ کسب و یا حفظ مقام شرکت در بازار خودرو چه فشارها و یا مصائبی اعم از سیاسی /اقتصادی/اجتماعی/تکنولوزیکی/قانونی و یا رقابتی را احساس می کنید؟وچگونه با این فشارها مقابله می کنید؟	➢ چه کسی وظیفه کسب این اطلاعات را بر عهده دارد؟ ➢ روند نشر اینگونه اطلاعات به چه نحویست؟ ➢ در صورت نیاز برای تصمیم گیری در این موارد چه کسانی مسئول هستند؟ ➢ لطفا با ذکر مثال توضیح دهید؟	3 , 4 , 5 , A, B, C , E

Above questions will measure: Application capacity

AP1: New knowledge exploitation   AP2: Development of patents   AP3: Technological proactiveness

Knowledge Creation

4. Knowledge Creation (KC)		
Main questions for	Probing questions	Interviewees
به چه نحوی کارکنان را در راه ابداع اندیشه/تکنولوزی تشویق می کنید؟ .3	➤ چگونه و در چه زمانی کارکنان را تشویق به بکار گیری روشها و دانش های نا مرسوم و غیر معمول می نمائید؟ ➤ در صورت موفقیت چه گونه برخورد می کنید؟ ➤ در صورت ناموفقیت چگونه برخورد می کنید؟	3 , 4 , 5 A , B , C , E
کارکنان چگونه تشویق به همکاری با همکارانشان می شوند؟ .4	➤ کارکنان چگونه تشویق به اشتراک گذاشتن دانش خود با گروه کاریشان می شوند؟	All

1: Culture for risk taking   2: Culture for teamwork   3: Number of new product and service (to be asked in general questions)
4: Knowledge Stocks   (a part of screening questions)

Knowledge Transfer

5. Knowledge Transfer (KT)		
Main questions for	Probing questions	Interviewees
12. نحوه همکاری دپارتمان خود بین JVS را شرح دهید ؟ 13. حوزه شما (JVS) چگونه با دیگر حوزه ها همکاری می کند؟ 14. چه کسانی مسئولیت هماهنگی بین شریک خارجی و دپارتمانها را برعهده دارد ؟ 15. چگونه تجربه و دانش خود را بین دپارتمان و شریک خارجی تقسیم میکنید ؟ 16. تفاوت اساسی بین روشهای همکاری بین شریک خارجی و دپارتمان بومی را شرح دهید ؟ (روشهای همکاری) ؟ 17. این کدام حوزه شریک خارجی و دپارتمانها همکاری تنگا تنگ دارند ؟	➢ آیا دانشی که بصورت محلی (در داخل ایران خودرو) به وجود آمده را به کارخانه دیگر و یا R&D دیگر بین سالهای 97 تا 2010 انتقال داده اید؟ ➢ چه اقداماتی را جهت انتقال دانش به دیگر سازمانها و یا دیگر R&D به عمل می آورید؟ ➢ آیا همانند روشهای ذکر شده بالا دانش و یا اطلاعاتی را برای بکار گیری درسازمانتان از R&D های دیگر کسب کرده اید؟	3 A,B,C,D
1. چه چیزهائی را از شرکاتتان با شریک خارجی بدست آورده اید ؟ 2. چگونه این آموخته ها به حوزه شما انتقال یافته است ؟ 3. کدام بخش و دپارتمان بیشترین سود را از این آموخته ها کسب کرده است؟ چرا ؟ 4. کدام بخش کمترین سود را از این آموخته ها کسب کرده است؟ چرا ؟ 5. چه دانشی از طرف شما به سمت JVS ارسال میشود ؟	➢ در مورد روند کار ➢ در مورد تکننولوژی ➢ در مورد مهارت کاری	2 , 3 A , B , C , E

New Product Development

6. New Product Development (NPD)		
Main questions for	Probing questions	Interviewees
9. حوزه شما چگونه NPD را به کار میگیرد؟ روند تولید محصول جدید را توضیح دهید؟ مثال 10. آیا از روش دیگری قبلا استفاده نموده اید؟ 11. لطفا با ذکر مثال نحوه کاربرد آن را توضیح دهید؟ 12. آیا از دیگر روشهای به کار رفته در روند NPD در دیگر شرکتها آگاه هستید ؟ 13. آیا در فکر به کار گیری این روشها می باشید؟	➤ چگونه و کجا یک پروژه جدید NPD آغاز میشود؟ ➤ چه کسانی وظیفه اتخاذ تصمیم نهای را بر عهده دارند؟ ➤ طرح و یا اندیشه جدید از کدام بخش نشآت می گیرد؟ (مدیریت میانی ، فوقانی ...) ➤ رابطه با دیگر NPD ها را چگونه توضیح می دهید؟ ➤ آیا هر یک از دیپارتمانها مجزا به روند تولید محصول جدید می پردازد؟ویا یک تیم خاص تمامی روند تولید محصول جدید را بر عهده می گیرد؟ ➤ نقش کارکنان بخش بازاریابی و فروش را در روند NPD را شرح د هید ؟	4 , 5 B , C, E
موفقیت: 14. نحوه سنجش سطح موفقیت و یا ناموفقیت در پروژه تولید محصول جدید چیست؟ 15. کدام روش سنجش موفقیت را در حال حاضر به کار می برید؟(مالی و یا غیر مالی)	➤ به نظر شما کدام ابزار سنجش جهت ارزیابی موفقیت محصول جدید ارائه شده مناسب می باشد؟ ➤ به چه نحوی این پیشرفت ها را آزمون و تائید اعتبار می کنید؟ ➤ در کدام مرحله نظریه مشتری ها NPD را بهبود میبخشد؟	3 , 4 , 5 B , C, D , E
روند: 16. منبع اصلی ایده های محصولات جدید از کجا نشعت می گیرد؟	➤ چگونه اعتبار محصول جدید از نظر مصرف کننده را جویا می شوید؟	3 , 4 , 5 B , C, E
17. نحوه کارتان با تآمین کنندهگان قطعات چگونه است؟	➤ آیا آنها تاکنون طرز فکر نوینی به شما ارائه داده اند؟نحوه برخورد شما چگونه بوده است؟ ➤ لطفا مثالی در این مورد ارائه فرمائید؟	3 B, E,

Closing Remark:

آیا مطلب خاصی در مورد شرکت و یا حوزه کاری تان می خواهید اضافه کنید؟ :Q

- ➢ با تشکر
- ➢ آیا نیازی برای مصاحبه با این شخص جهت روشن شدن مطلبی لازم است؟
- ➢ بعد از اتمام مصاحبه از شخص مورد نظر نظرات شخسیش را در مورد شرکت جویا می شوم
- ➢ انعکاس نظرات مصاحبه شونده بعد از مصاحبه نوشته می شود.

- ➢ ****این امر مهمیست برای تشخیص صداقت پاسخهای مصاحبه شونده

Appendix 14: Follow-up questions in Persian

Inter-Organisational factors

1. لطفا درباره نحوه فعالیت و همکاریتان با شرکای مختلف بین المللی خود توضیح دهید ؟

2. به چه مشکلاتی هنگام همکاری بر روی پروژه های مشترک با شرکای خارجیات روبرو میشوید؟

3. به چه مشکلات اساسی و مهم در طول پروژه ای مربوط به سه مدل کار برخورد کردید ؟

4. چگونه بر این مشکلات فائق آمده اید ؟

5. لطفا در مورد نحوه کارتان و تفاوتهای موجود قبل و بعد از پروژه های مشترک با شرکای خارجیتان شرح بدهید؟

6. نحوه کار شرکای بین المللی تان را چگونه ارزیابی می کنید؟

7. ایا احساس کردید که نحوه کارتان بایستی با آنها وفق داده شود؟ چگونه این کار ا کردید؟

8. مهمترین آموزه هایتان از شرکای تجاریتان چه بوده و چگونه به این آموزه ها رسیده اید؟

9. چگونه از این آموخته ها استفاده کردید؟

10. آیا مسائل خاصی وجود دارد که روابط کاریتان را با هریک از شرکایتان را تحت تاثیر قرار بدهد؟

11. چه کار و یا روش خاصی در جهت یادگیری از شرکایتان در پیش گرفته اید و یا میتوانستید انتخاب کنید؟

12. چگونه اطلاعات مربوط به خط تولید را دریافت می کنید؟

13. آیا از نحوه و چگونگی انتقال اطلاعات از خط تولید به خودتان راضی هستید ؟

.14 در صورت خصوصی بودن شرکت ایران خودرو به نظر شما چه تفاوتهائی با وضع فعلی میداشت؟

.15 تکنولوژی خودروسازی ایران خودرو در مقایسه با رقبای بین المللی را چگونه ارزیابی میکنید ؟

.16 ارزیابی شما از کیفیت خودروهای تولیدی ایران خودرو در بازار داخلی و خارجی چیست؟

.17 مزایا و معایب ایران خودرو در مقایسه با هر یک از شرکای بین المللی چیست؟

.18 مدیران ارشد چه ارزیابی از سه برند پارس , سمند و 206 دارند؟

.19 ایا روش خاصی جهت کسب دانش فنی جدید و انتقال و ذخیره دانش کسب شده در شرکت وجود دارد؟

.20 موفقیت و شکست یک پروژه یا طرح را در مجموعه NPD را چگونه تعریف میکنید ؟

.21 موفقیت آمیز ترین طرح در تاریخچه NPD   شرکت ایران خودرو چیست و دلایل این موفقیت را بازگو کنید؟

.22 ناموفق تریت و مهمترین شکست در تاریخچه NPD   شرکت خودرو و دلایل این عدم موفقیت را بازگو کنید؟

.23 ارزیابی شما از نحوه همکاری هیئت مدیره ایران خودرو در مورد فعالیتهای NPD   در این سه مدل را بازگو کنید؟

.24 روش شناسائس مسئولیتها و وظایف کارمندان چگونه است ؟ دلایل موازی کاری ها در چارت سازمانی چیست؟

.25 آیا روش خاصی جهت تشویق کارمندان وجود دارد؟

.26 چه پروژه هائی را بیشتر می پسندید ؟

.27 تعریف شما از یک پروژه پر ریسک چیست ؟

.28 در دو سال گذشته   کارمندان تازه استخدام شده از چه منابع و از چه روشهائی به ایران خودرو وارد شده اند؟

.29 از دست دادن چه کسانی برای ایران خودرو مشکل ساز است و چرا ؟

.30 به نظر شما چه کسانی را میتوان متخصص و یا کارشناس فنی نامید و چرا ؟

.31 چه کسانی نقشی موثر در اجرای یک پروژه را دارا میباشند و چه عواملی این قبیل افراد را کمک میکند؟

.32 دانشهای فنی موفق و یا ناموفق را چگونه ثبت میکنید و چه کسانی به این اطلاعات دسترسی دارند؟

.33 چه عواملی اشتراک دانش مابین بخشهای مختلف ایران خودرو را تسهیل میکند؟

.34 چگونه اشخاص تخصصی را آموزش می دهید ؟

.35 همکاری بین بخشهای مختلف ایران خودرو به چه صورت بوده و راههای بهبود این ارتباط؟

1. آیا در همکاری با شرکای بین المللی با سختیهای خاصی مواجه شده ایدو چگونه میشد پیشگیری کرد؟

2. اطلاعات مشتریهای تان را چگونه جمع آوری میکنید؟ و چگونه از این اطلاعات استفاده میکنید؟

3. نحوه فعالیتان با تآمین کنندگان قطعات چگونه است ؟

4. ایا دانش خاصی را از همکاری و فعالیتان با تلمین کنندگان قطعات کسب کرده اید؟

5. نقش ساپکو چیست ؟ و چگونه با ساپکو همکاری میکنید؟

6. چه عواملی ممکن است نحوه فعالیتان را با تامین کنندگان قطعات را بهبود ببخشد؟

7. آر این گونه پروژه ها چه چیزی آموخته اید؟

8. ایا فکر میکنید پروژه SD موفق بوده است یا نا موفق؟

9. علل شکست و یا موفقیت را در چه میبینید؟

10. چه چیزهای خاصی را در طی پروژه SD از شریک خارجی آمختید ؟

11. چرا این آموخته های کسب شده در طول پروژه SD را نتوانستید به نحو احسن در دیگر پروژه ها به کار ببرید؟

12. همکاریتان با دانشگاهها چگونه است ؟

13. جهت کسب دانش و تکنولوژی به روز چه اقداماتی را انجام داده اید ؟

14. نحوه آغاز به فعالت در ایران خودرو چگونه برای شما بود ؟

15. متخصصترین و آگاهترین افراد در ایران خودرو و خارج از ایران خودورو را چه کسانی میدانید ؟

16. چگونه میشود این افراد متخصص را به همکاری با ایران خودرو ترغیب کرد ؟

17. ایا اطلاعاتی در مورد تاریخچه ایران خودرو دارید ؟ این اطلاعات را از کجا کسب کرده اید؟

Appendix 15: The candidates' personal information

A: The 24 candidates' educational background

ducational Level	NPD Department	Strategy Department	Marketing Department	Quality Department	HR Department	SAPCO Department	Total
Secondary Degree	-	-	-	-	-	-	-
High School Degree	-	-	-	-	-	-	-
College Degree	-	-	-	-	-	-	-
BSc / BA Degree	2	1	1	-	-	-	4
MSc / MA Degree	5	6	-	1	4	1	17
PhD Degree	1	1	-	-	-	1	3
Total number of candidates	8	8	1	1	4	2	24

B: The 24 candidates' age range

Age Range	NPD Department	Strategy Department	Marketing Department	Quality Department	HR Department	SAPCO Department	Total
25- 29	-	-	-	-	-	-	-
30-32	-	2	-	-	1	-	3
33-35	-	-	-	1	-	-	1
36-38	-	4	-	-	1	-	5
39-41	6	1	1	-	1	-	9
42-44	-	-	-	-	1	-	1
45-47	-	-	-	-	-	-	-
48-50	1	1	-	-	-	1	3
51-anove	1	-	-	-	-	1	2
Total	8	8	1	1	4	2	24

- **In age 18 students finish high school. Boys cannot employ before compulsory military service. The service is 24 months**
- **Usually university degree (BSc/ BA) takes minimum 4 years**

C: The 24 candidates' degree titles

No	NPD Department	Strategy Department	Marketing Department	Quality Department	HR Department	SAPCO Department
1	MA in Philosophy					
2	BSc in Industrial engineering					
3	BSc in Industrial engineering					
4	MSc in Industrial engineering					
5	MSc in Mechanical engineering					
6	MSc in Mechanical engineering					
7	MSc in Mechanical engineering					
8	PhD in Electronic engineering					
9		MBA				
10		BSc IT				
11		MBA				
12		MSc Industrial engineering				
13		PhD Management				
14		MBA				
15		MSc Industrial engineering				
16		MA in Management				
17			BA Management			
18				MA Mechanical engineering		
19					MBA	
20					MA Industrial engineering	
21					MA Psychology	
22					MA Math / IT	
23						PhD Mechanic
24						MSc Mechanic

D: The 24 candidates' pervious work background

| No	NPD Department	Strategy Department	Marketing Department	Quality Department	HR Department	SAPCO Department
1	3 years at SAIPA's R&D					
2	Came after university					
3	2 years at IKCO production					
4	Came after university					
5	12 years at SAIPA's R&D					
6	5 years at HYUNDAI sale					
7	3 years project manager inspection					
8	20years academic board					
9		4 years academic board				
10		12 years at it field				
11		4 years at industry				
12		10 years at SAPCO				
13		6 years at IT field				
14		10 years research expert				
15		2 years at marketing				
16		2 years research expert				
17			6 years at marketing field			
18				4 years industry		
19					3 years industry	
20					3 years industry	
21					After my uni	
22					3 years IT	
23						4 years in MEGA
24						15 years academic

IKCO's current products

Suzuki Grand Vitara

Samand & Samand LX
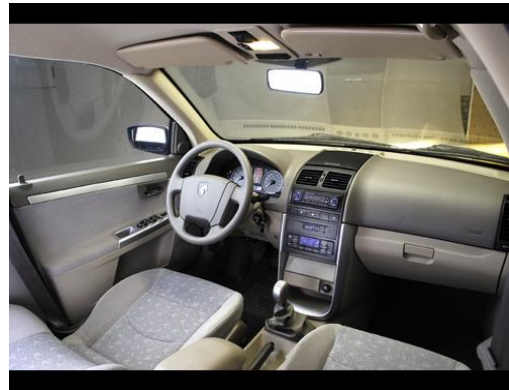
Samand Soren

Samand Soren LX   **Samand Sarir**

Peugeot Pars (Persia) LX

Peugeot 206

Peugeot 206 SD

Peugeot 207i

Renault L90

Peugeot 405   **Peugeot 405 SLX**

ROA

Paykan Pickup (Bardo)

RUUNA

DENA

Paykan 1967 – 15/05/2005

IKCO'S COMMERCIAL VEHICLES:

اتوبوس بین شهری
Sc 457

کشنده فراز
New Product

کشنده Axor
1843

کامیون بنز
2624

کامیون بنز
1924

کمپرسی سهند
Sahand

کامیون بنز
608

کامیونت
Mighty

مینی بوس
Chorus

آمبولانس
Sprinter

اتوبوس شهری
O 457

اتوبوس
Megatrans

اتوبوس بین شهری
C 457

IKCO's site photos (Tehran):

IKCO's production line (Tehran)